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MODERN MEDICINE OF THE ENGLISH-SPEAKING RACE.

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The complex fabric of modern civilization is surrounded by an upheaval of thought unparalleled in variety and unequalled in extent of movement, at any period of man's history. Ancient ideas give way at almost every point to the assertions, speculations, and discoveries of the day. These spring up with so great rapidity that there is scarcely time to estimate their import, or to weigh their value. We watch wave following wave on the ocean shore, and we notice how, after a momentary existence, each is overwhelmed by the one that follows, and both are soon merged in the past. The bystander, for his short time, notes fresh masses forming in constant succession, advancing, breaking. The new seem like the old in form. Yet no two are exactly the same, save only in this, that they advance, recede, and perish.

The course of human thought is not wholly unlike these inanimate forces thus ceaselessly brought into play. Yet human thought has another quality connected indissolubly with it, and illustrated by the cosmical actions operating in our planet. Human thought, like life in this globe of ours, has in it an element of steady progress and of development which does not accompany the restless movements of the ocean tide.

These advance and recede, to advance again; but the changes they effect, great though they be when looked at through uncounted ages, are

changes limited strictly in degree and strictly in kind. In life on the globe, evolution, if neither uniform nor steady, has been at all events progressive, if tested by any rational test of progress. Human thought, like life in the earth, has advanced in most directions, even though it have in some gone back.

As the material organisms, those marvellous machines which make mental action in this world possible, have, on the whole, become more perfect through prehistoric periods, so the mass of human knowledge, since we have record of the human race, has become greater, purer, truer. With all our errors, with all our blindness, and with all our backslidings, there is steadfast yearning after truth, and an ever reaching forwards toward good. Our conception of the relation we hold to the whole order of things is more clear, and is, perhaps, more true. The light of keen criticism is turned with full blaze on every quarter, and from every side. Though the variously colored rays impart not seldom confusion more bewildering than darkness, in the end, the "lumen siccum," the pure white light for the most part prevails. It then at once illuminates, defines, and warms.

In nothing are these analogies more true than in the history of medicine. Nor can a better illustration be found in that history than in the undertaking to which these few words are to form an introduction. Would that it had fallen to a stronger hand to pen them.

It is proposed to issue a quarterly journal of purely scientific and practical medicine, which is to be, in certain directions, a common vehicle of medical thought for the English-speaking race. It is a great project, and one worthy of success, though open to criticism for its daring. Into the prospects of such an undertaking, looked at from a commercial or the publisher's point of view, this is not the place to enter. That, no doubt, has been fully considered. Nor is it here, either, that should be fully discussed all the objections that may be raised from the scientific and literary side. The criticisms that may be reasonably advanced should, however, be frankly acknowledged. They are few, and to these the answer is simple. Although the existing number of medical journals, to be counted by several hundreds, is so great, yet there is no journal with the aim of the present. The sole questions, therefore, in this direction are as to the wisdom of the aim.

First. The aim being admitted to be good, it cannot be attained. To this objection a short reply may be given in the form of an axiom. The conditions of the English-speaking race are such, geographically and politically, and the means of intercommunication are so unceasing, that it is an imperative duty, in the interest of mankind, to collect periodically into suitable form the information which they furnish, as being most important, and progressively important, for the promotion of public and personal health throughout the world.

Secondly. That the aim is too narrow. Be it so. The aim is wide enough. It is indeed true, that an attempt to formulate certain data bearing on the diseases of the whole human race has been already begun, and that the successful inauguration of a Committee for the International Collective Investigation of Disease, last year at Copenhagen, will produce, it is to be hoped, a permanent effect on investigation and on literature. This quarterly journal will in no sense interfere with that great undertaking. It will neither forestall it, nor lag behind it. It will aid it, on a different line. It will make use of its results and it will further its objects. How this is, will be seen more fully at a later stage of the following observations.

We have to call to mind that the art of medicine began, without doubt, from the simple desire to obtain and to afford relief in diseases, and other injuries. To staunch a wound, to unite, if possible, a fractured limb, to quench a burning thirst, were objects manifestly to be attained. Natural love led the family or the friends to fulfil this service. Those most apt would then, in similar conditions, be the most sought for again. The nurse would quickly found a profession, which would attract admiration and earn gratitude. Women and men would alike follow it. The arts of Surgery and Medicine, however rudely, would thus be established; and, conjointly or separately, would gain their hold as integral parts of the tribal organization. So beneficent and noble a work would need the appearance on earth of a gifted soul like Hippocrates, to establish a definite art, or mystery, and to suggest a future and possible science. This once begun would never cease. All the virtues and all the vices of an established guild would be rapidly stereotyped. Truth and falsehood, honesty and pretension, learning and ignorance, true observation and mistaken inferences, authority and subservience, factious opinions, misleading self-assertion, feebly opposed by moderation, which is seldom popular, would all take their place. Rapidly would the most intricate, the most amazing, the most subtle of all created things, the human frame in health and in disease, become the centre of traditional beliefs, some true and noble, some false and degrading. And as the human race became developed, or the world more thickly inhabited by the human family, and the interchange of ideas more regular and more facile, sound knowledge bearing on the physical needs of man, on his physical education, and on the modes of perfecting its stamina, and procuring his euthanasia at the time of his departure, would be handed on from one to another people, accompanied by the natural and inevitable result of national prejudice, and of faulty generalization from misapplied and mistaken similarities.

And in truth this, to speak roughly, is the history of medicine in the world up to the present century. This century is the century of criticism and of experiment. It is, therefore, the age of transition. In

the course of its criticism, and its experiments, and in its transition, it has had to devise new methods. By its new methods it has acquired new powers. Two of the chiefest of these powers are: first, a multitudinous host of individual skilled observers, flooding the world with precise individual observations; and, secondly, the organisation of associations for the direction of inquiry, the sifting the wheat from the tares, in the vast harvest gathered by individual reapers, and the reducing of isolated data into principles and laws.

It has been wisely said that there are times in a man's life when he should ask, where he is, whence he comes, whither he is going. The same severe questioning may be, and should be, put to themselves by most nations, and with reference to many kinds of subject matter. If we put it to Medicine, it is not hard to answer. Prophecy being rash, the third question, which is of the most moment, whither it is going, demands the most careful reply, and may for the moment be deferred. To the second question a reply has already in fact been given. Medicine is in possession of a heterogeneous mass of real and of supposed knowledge, accumulated at the lowest computation, during 3500 years, in which the principles and conclusions of great men have floated in a sea of statements and traditions, unparalleled except by the accumulated follies of false religions.

To the first, "Where we are," the reply is that, as has also been said, "We are in a new era of precise observation, of experiment, and of criticism, with all their advantages and their dangers."

And so the reply to the third is, that we are going whither the balance of these three great factors of scientific progress may lead us.

Whither this may be, it is, upon the whole, not far to seek.

For 1st. What is the true function of medicine as we now view it?

2d. How is this function to be best carried on? that is to say, what are the factors upon which the science and art of medicine, at the present age of the world, depend?

1st. As was remarked just now, the origin of medicine was the benevolent desire to relieve suffering; and so it was synonymous with the "healing art." Its function has become far wider. Whatever be the duty of individuals, medical art and science collectively now aim, as a whole: 1st, at the preservation of health; 2d, at the averting disease from individuals and from nations; 3d, at rearing healthy progeny for the family and the State, by probing the laws of inheritance; and, 4th, by procuring legislation effectual to these several ends.

It claims, therefore, a right to a voice in moral education as well as physical training; it holds a duty in relation to the diminution of vice for the sake not only of its self-destroying victims, but more for the sake of the innocents whom they ignorantly slay. In short, medical science, openly or unseen, pervades and influences our private and public life

from the kitchen to the camp and the fleet; from the cottage to the palace. It sends its messages to the school, its dictates to municipal organizations. It performs these duties equally with its infinite services in hospitals to the sick; in refuges for the insane, and in the homes of the convalescents.

If we ask by what agencies medicine purposes to qualify itself to perform openly or silently such complicated preventive and preservative, as well as curative, functions, the reply which we receive is some such as this: "By appropriating all the confirmed conclusions of the biological sciences which bear on the health and the inheritance of the human race, however descended, and under whatever climatic and local conditions situate."

A moment's reflection only is needed to show the vastness of the inquiry contained in this statement. It affirms that which cannot be reasonably contradicted, that the complete science of the prevention of disease, and of the preservation of health in man, will include a knowledge of all conditions in which any branch of the human family is placed, and of the relations of individuals of the family by descent and inheritance one to the other, to a common origin, or a diverse stock. In short, it will be based on the conclusions of a progressive morphology, physiology, and embryology, comprising, as they do, the history of all things that in our planet have life. It will, moreover, study the relation of life to all matter in our world which does not possess the properties called living, and the *modus operandi* of all cosmical forces in the two kinds of matter, respectively, the forces, that is, that belong to all matter, and the combination of them, whatever that may be, which operates in living things, and which for distinction, and as the lawyers say, without prejudice, is now called in the place of the old vital principle, metabolism. When through the perfected knowledge of physics and chemistry, and of climates in their application to living organisms, and when through the teachings of pathological evolution now looming in the distance, we know the conditions of health, then, not till then, will the ideal standard, which is to test what is "not health," have been attained.

Morphology, physiology, embryology, attempt to lay down the laws of the normal organism, vegetable or animal, of every degree of perfection, wherever situated, at whatever period of the world existent, however evolved. These sciences being in no sense arts, are still intimately connected with the great subject of disease, or pathology. This is intermediate between the three pure organic sciences, and the art of therapeutics which rests upon both, and contributes factors to both. And first as to pathology in its relations to this paper. If the borders of the three organic sciences just named are as extensive as has been said, those of pathology cannot be narrower. For there are the disorders

of all plants, and all animals, and all races of man, and departures from the normal health standard as numerous as the "species," perhaps as numerous as the individuals, or the families to which they belong. They are, moreover, indeed as numerous as the organs, and the textures of each, without reckoning the general diseases which are not confined to organs and textures, but affect the whole organism. As the subject opens up it would seem to bewilder from its extent and complexity. For this bewilderment the remedy will presently appear. The fact remains, and it can be no other.

As there is a similarity more or less great, more or less divergent, in the life conditions of all living organisms on our planet, both in respect of their past history and their present normal mechanism, function, and origin, so must there be between their several non-health tendencies and acquired abnormalities. Although happily for us, these are not all intercommunicable, it has been proved, as is known to every one, that between certain diseases of man and of other animals there is not only a casual and accidental, but an actual and necessary relation, as in some of the entozoa, and in a not necessary, but a possible, way, in tubercle and other disorders. Nor is this all. For as there is this correlation between the possible disorders of certain organisms one with the other, so the correlation probably does not exist equally in every part of the globe, but only in some parts, that is, the infectivity depending on climate or on localized microbes, is not everywhere the same.

Another factor has to be added, and a striking one, viz., that diseases have a history of time, as well as of place, and that they have appeared and disappeared, at varying periods, some at very long, and some at short intervals; and they have remained in varying degrees of intensity for many centuries in a manner more or less constant, of which the most notable illustrations may be found in cholera and in leprosy, both in respect of time and of place.

And lastly, there is the vast pathological question of inheritance of disease, whether in man or in animals. Only two need be alluded to in illustration, epilepsy and syphilis. The former has been elucidated by the experiments of Brown-Séquard, and the latter by innumerable observations and inquiries in almost every country for the last four centuries, with regard to this ancient scourge of humanity. The mere mention of these four, cholera, leprosy, epilepsy, and syphilis, raises in every well-informed mind an almost overwhelming cloud of thought in the direction of causes, disasters, and remedies, operating through thousands of years on the human race. The attempts to form a science of the diseases of mankind on a really scientific basis, have received great impulse from the *Handbook of Historical and Geographical Pathology*, prepared, with marvellous labor and philosophical insight, by Professor Hirsch, of Berlin. This work, accessible now to all English readers, has once for

all laid a foundation on which all the vast accumulating mass of pathological observation in the world of medical inquiry may be systematically and scientifically classified and arranged.

The third great department of scientific medicine to which reference should here be made, that of therapeutics, belongs in a greater degree to the category of an art than either physiology (in its three subdivisions) or pathology; but not for this reason is therapeutics either less definite or less in need of scientific handling. It is sometimes supposed that therapeutics is mainly empirical. There can be no greater error. It is, in fact, based either on positive science, or it is experimental. It rests either on certain knowledge definitely ascertained, and precisely used, in which case it has known results which can be foretold, or it rests on experiment, in which case the experimenter, as in a purely scientific experiment, extorts from nature an answer valuable according to the knowledge and skill which he brings to bear on the individual case. Therapeutics, like physiology and like pathology, concerns itself in these days with the whole range of disease in organized nature. Now it deals with the vegetable world, as in the case of the potato disease, or the vine disease; now with lower animal forms, as in the diseases of the silkworm, the battle-ground and great victory of Pasteur. Now it experiments on the domestic animals useful to man, as in the anthrax of sheep, a further triumph of that great observer; or it studies the treatment and prevention of the plague in the bovine races. In all these several cases, therapeutics finds entangled in its meshes thousands upon thousands of observations and statements, resting on authority of every degree, whether of high value or of utter worthlessness. It were an error to suppose that we have reached a time when none but scientifically tested assertions find their way into the current literature of therapeutics. This is not the time or place for discussing this matter; yet, by the way, it must in truth be said that, notwithstanding the brilliant discovery of certain true remedies, and of invaluable palliatives of modern times (such as quinine, chloroform, and iodine); and notwithstanding the precise correlation established in many cases between the lessons of normal physiological experiment, and therapeutical action in abnormal states, there has been no period in medical history in which a greater number of reckless assertions are yearly sent broadcast into the world. To name instances would here be out of place. They will occur to every reader.

The observations and records of physiology and of pathology, though in different degrees, have been derived in large measure from organisms other than man, by means of experiment. The most extensive, and by far the most accurate teachings of therapeutics, come from observation and treatment of man, chiefly in the great hospitals of the Christian era. The astonishing acumen of Hippocrates, Galen, Aretæus, and a

few more of the ancients, must not be forgotten. But the want of anatomical precision, and of the results of microscopic research, make the records even of Morgagni, comparatively, of small value. The observations of trained observers—trained, that is, in the purely scientific methods of physiology—before proceeding to the study of disease in the highest organisms, will produce, and are producing, results by the bedside of equal therapeutical value; perhaps, indeed, of greater truth than those of the experimenter on animals. Morbid action is a great physiological teacher. It has to be observed that, in the study of human therapeutics, a new element is introduced. This element shall be expressed in the words of one of the most attractive clinical teachers of this century.

"Diseases are not abstractions; they are modes of acting, different from the natural and healthy modes—modes of disorganizing, modes of suffering, and modes of dying; and there must be a living, moving, sentient body for all this.

"This body must be your study and your continual care—your active, willing, earnest care. Nothing must make you shrink from it. In its weakness and infirmities, in the dishonors of its corruption, you must still value it, still stay by it, to mark its hunger and thirst, its sleeping and waking, its heat and its cold, to hear its complaints, to register its groans.

"And is it possible to feel an interest in all this? Aye, indeed, it is; a greater, far greater, interest than ever painter or sculptor took in the form and beauties of its health.

"Whence comes this interest? At first, perhaps, it seldom comes naturally; a mere sense of duty must engender it; and still, for awhile, a mere sense of duty must keep it alive. Presently the quick, curious, restless spirit of science enlivens it, and then it becomes an excitement, and then a pleasure, and then the deliberate choice of the mind.

"When the interest of attending the sick has reached this point, there arises from it, or has already arisen, a ready discernment of diseases, and a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in the process of time, experience forms the consummate practitioner.

"But does the interest of attending the sick necessarily stop here? The question may seem strange. If it has led to the readiest discernment and the highest skill, and to form the consummate practitioner, why need it go further?

"But what if humanity should warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle and invested with a moral motive, and passes into the heart. What if it be carried still further? What if religion should animate it? Why, then, happy, indeed, is that man whose mind, whose moral nature, and whose spiritual being, are all harmoniously engaged in the daily business of his life? with whom the same act has become his own happiness, a dispensation of mercy to his fellow creatures, and a worship of God.

"Such a man any of you may be; but you must begin by learning to stand by the sick-bed and make it your delight."

So, in 1836, said Latham, no mean disciple of Galen, who nearly seventeen hundred years before wrote at the end of his great treatise "Περι χρειας των ἐν ἀνθρωπου σωματι μοριων," that all his anatomical facts and studies were as hymns sung before the gods.

The temper which is thus inculcated belongs not to him only who truly seeks the alleviation of human suffering, physical or mental, but

to him who, against his nature, is often forced to wrest the secrets of life from living animals lower than men, for their sake and the sake of the whole human race.

The generalities here dimly portrayed have to be considered in their practical relation to the conditions and progress of medicine among English-speaking peoples. This relation is obvious enough, and is twofold: first, in respect of the subject itself; and, second, in respect of the persons who affect the conditions and retard or promote the progress.

As to the subject little more should be said. The subject is coextensive with every branch of the human family, affects every individual in it, of every age, of every color, and every creed, every government. It concerns men of science, however wide their pursuits or limited their objects in physics, in chemistry, in biology. It concerns all who, though considering scientific study to be neither their duty nor their forte, are devoted to the practical, beneficent, and benevolent charge of the feeble and the sick, of the young and the old. These practical philanthropists are interested in the progress of all true, in the elimination of all spurious statements, from preventive or curative medicine. Every real discovery, every simplification of principle, every blow to specious but unnecessary fancy in this direction, promotes, to some extent, the education of the world. This being so with the quality of the subject, it remains to say a word on the special opportunities which lie within the reach of the English-speaking people for aiding it; and, secondly, on the means actually now employed.

The opportunities are of two kinds, those which occur to official persons and those which are enjoyed by private practitioners. Whether official persons have done all that can be done toward a science of medicine admits of question. But in every part of the English-speaking world they have begun, and in some places have advanced in this century in an unprecedented way. Official documents, accessible to all, emanating from England, Scotland, and Ireland, from India and the Colonies, have thrown a flood of light on the etiology and the prevalence of disease, and have promoted steadily progressive legislation. The United States have taken up the same gigantic work in every department of biology, normal and abnormal, with the rare opportunities of their vast territory, and their various peoples. A glance at the eleventh volume of the *Tenth Census of the United States* will show the success as well as the difficulty of obtaining correct data as to the sanitary condition and vital statistics of the States. But the work is in the hands of Dr. Billings, and that is a guarantee for whatever industry, genius, and philosophic acumen can accomplish in this direction. This statement, so brief, tells that official records are accumulating in one language, as to the health conditions of three hundred millions of people, in almost

every parallel of latitude between the terrible belts of perpetual ice that environ either pole; on nearly every isothermal line; by mountain and valley; among people civilized and uncivilized, of almost every race and inheritance, men of every occupation and trade, living in every condition of luxury or of want; of every religion; practised in every act of virtue, and steeped in every form of vice. So that these records alone will presently form the basis of a science of comparative national health.

But besides these great official sources of knowledge, are the far more numerous data, which, in truth, supply them. Witness, for instance, the causes of death, in vital statistics. When Dr. Billings writes that "'teces,' 'colory in phantum,' 'colvia fontine,' 'hasphmar,' 'struck in on the air-cells' are reported by 'physicians,' it is evidently unsafe to lay too much stress on the scientific accuracy of diagnosis by the same reporter in other cases, even although the spelling may be more nearly correct."

The corollary from this illustration is that every endeavor should be made by public and private means to secure good general education for the medical students of the future. Useless will be the progress of "physiology and pathology and therapeutics" to those districts which are served by "physicians" ignorant of them. On the medical education of the future we may look with not only hope but confidence.

This rude survey must now be brought to a close.

Some apology is offered to science for the assumption that there is room for a scientific journal with the apparent restriction to one language and one human stock. Science has no restriction and a universal brotherhood; but science has her votaries everywhere, and every language can contribute its share. The present endeavor is to offer to those who seek it a means of hearing a message from English-speaking people, which, apart from politics of every kind, may gather results profitable to medicine, learnt from types of every climate of the globe, from very many races of the most diverse origin, and from every occupation and every condition in which the human family is engaged. The error lies, if anywhere, in the greatness of the attempt. An apology is offered to the International Collective Investigating Committee, if, indeed, an apology be in place. Such an attempt as this to coördinate acquired truths from so wide a range as the English-speaking people can but aid, as has been said before, the profound and detailed inquiries conducted by that body. In no possible way can it rival, surpass, or check its precise labors.

The end, indeed, which one may propose to such a work is this—to bring together at regular intervals the thoughts and active criticism of men, who, bound by the tie of one common language, are still more closely linked by the love of truth applied to perfecting the bodily

nature of man. That bodily nature is the casket which contains the spirit, by which, and which alone, man is separated from the innumerable living cotenants of this planet, so complex, so wonderful, yet so petty, in the complete order of the universe. If England should ask whither she is being led, she may reply that her speech, embracing the States of America and the Australian continent, is called upon more and more to guide races of every color, and every state of evolution. The States alone have almost every climate and every kind of seaboard, and every topographical condition for habitation, and for produce, and every occupation for man.

Therefore, let it be said, that since there are so many races bound together by the same speech to further the cause of human progress, since there are in this brotherhood so many who hold divers forms of true religion, and some, too, who look on all religion as a byword and reproach, it is well they all agree in this faith, that to relieve the suffering and prevent the decay of masses of mankind form a part of all true religion—the religion of universal peace and goodwill toward men.

THE MITRAL CARDIAC MURMURS.

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The study of the mitral cardiac murmurs at the present time is of importance to every medical practitioner, as well as of interest to those whose attention is especially directed to the diseases of the heart. The purpose of this article is a reviewal of the existing knowledge of these murmurs, and an inquiry meets us at the threshold as to the number of them. How many murmurs, the seat of their production being at the mitral valve or orifice, are to be reckoned as mitral murmurs? After the description of the mitral regurgitant murmur by Elliottson, in 1830, for more than a decade of years this was the only mitral murmur recognized as such. Another murmur was added in 1843, by Fauvel, who first described distinctly the mitral direct murmur, named by him and known at the present time as the mitral presystolic murmur. The recognition of this murmur, as a presystolic murmur, has made its way very slowly, a fact remarkable in view of its distinctive characters. Even now, after more than forty years, it is by many not distinguished clinically from the mitral regurgitant murmur. It was described by the writer of this article in his treatise on the diseases of the heart, in

1859. Prior to this date, no American author had described it. A clear understanding of it by British physicians, according to the author of a late work on diseases of the heart, dates from a paper in 1861, by Dr. Gairdner. Although not recognized as such by all, its individuality is too fully established to require any discussion.

In the opinion of the writer of this article, two other mitral murmurs are to be added to the two just named. One of these was described by him in his treatise on diseases of the heart, in 1859. This is a systolic murmur, in most instances, probably, involving chiefly the mitral curtains, but produced without mitral incompetence. If there be no incompetence, mitral regurgitation cannot, of course, take place; hence, the murmur is not a mitral regurgitant murmur. It was designated a mitral systolic non-regurgitant murmur, and, also, an intraventricular murmur. The grounds for reckoning this as a distinct murmur will be presently considered.

Another mitral murmur has been noticed in several works, and the writer is unable to attribute to any one the credit of having first described it as an individual murmur. It is produced by the current of blood from the auricle to the ventricle prior to the auricular contraction. It is a mitral direct, but not a presystolic, murmur. In point of time it is diastolic, and the name mitral diastolic murmur is an appropriate designation of it. The grounds for considering this as a distinct murmur will be stated later on.

There are thus four mitral murmurs, namely, (1) the systolic regurgitant, (2) the systolic non-regurgitant or intraventricular, (3) the presystolic, and (4) the diastolic. Each of these four murmurs has distinctive characters which individualize it. Two, three, and even all four may be combined in the same case. This statement, as will be seen, applies to the systolic regurgitant and to non-regurgitant murmurs. They are simply and explicitly designated. The names post-diastolic and post-systolic, proposed by Hayden, seem to the writer unnecessary refinements, and, therefore, objectionable. If the reader who has proceeded thus far would stop to reflect upon the inquiry whether the mitral murmurs offer topics for consideration and discussion of sufficient interest and importance to occupy the pages which are to follow, let him refer to that portion of the elaborate and able work on diseases of the heart, by Hayden, which treats of the cardiac murmurs. He will there find defects in our existing knowledge, together with differences of opinion in regard to the number of the mitral murmurs, their characters, their significance, and the modes of their production, which must convince him that they afford scope for an article extended much beyond the limits to which the writer will restrict himself. In fact, the object of the article is to present certain conclusions and suggestions without attempting to consider the subject comprehensively and fully.

It is a fact not to be lost sight of in the study of cardiac murmurs, as of all auscultatory signs, that knowledge of their significance must be based on clinical experience, embracing, under the name clinical experience, observations during life taken in connection with examinations after death. In cardiac, as in pulmonary, auscultation, it is not safe to trust to reasoning from principles of acoustics. It will not do to assume from the characters of certain sounds that certain physical causative conditions must exist, or from the existence of certain physical conditions that certain sounds must be produced. Hence, our knowledge of the significance of murmurs, as of other signs, is by no means dependent on our ability to explain satisfactorily the mechanism of their production. Differences of opinion in regard to explanations need not impair the value of signs in a clinical point of view. Undoubtedly, however, it is desirable to explain the mechanism of signs, and this is a legitimate object of study, bearing in mind constantly the fact that whatever knowledge may be obtained in this direction is subordinate to clinical experience.

There is a method of study with reference to the mechanism of the cardiac murmur which seems not to have been considered in proportion to its value. This method consists in reproducing, artificially, the known morbid physical conditions which underlie the murmurs. Much can be done in this way to elucidate and demonstrate the mechanism of pulmonary signs. For example, cavernous respiration may be produced by very simple artificial contrivances which represent faithfully the passage of air to and from pulmonary cavities. In like manner, the presystolic murmur may be imitated out of the body, and the mode of its production within the body illustrated. Here is a fruitful field for the study of cardiac murmurs by those who can combine mechanical ingenuity with the requisite clinical and pathological knowledge.

In order to seek for explanations of cardiac murmurs, and to devise experimental illustrations, it is not necessary to be profoundly conversant with the science of acoustics. Comparisons on a large and a small scale are at hand. The ocean, if not lashed into fury, is silent, except when its waves are broken by the shore or by rocks. A brook, with its bottom and borders smooth, flows silently, but it is murmuring when the current is interrupted. Coming nearer, in respect of magnitude, to the heart and bloodvessels, murmurs may be produced by forcing fluids into rubber tubes and bags of varying size. Valvular-like sounds are produced by forcible tension of pieces of linen or muslin held below the surface of a liquid. Musical notes may be caused by a stream of liquid acting upon a vibrating body in a closed cavity. It is perhaps not impossible by ingenious contrivances to represent artificially all the variations in intensity, pitch, and quality of the cardiac murmurs, together with the normal heart-sounds, and their abnormal modifications.

Returning to the four mitral murmurs, these are naturally divided into two groups, as follows: The mitral regurgitant, with the mitral non-regurgitant, or intraventricular murmur, form one group; and the mitral diastolic, with the mitral presystolic, form the other group. They will be considered as thus grouped in this article.

1. *The mitral regurgitant and the mitral non-regurgitant or intraventricular murmur.*

A systolic murmur having its maximum of intensity at or near the apex of the heart, transmitted in a horizontal direction to the left of this point, and heard near the lower angle of the scapula, associated with more or less enlargement of the heart, together with weakening of the aortic and accentuation of the pulmonic sound, is an unmistakable sign of mitral incompetence. On this point there is no room for discussion. In a practical point of view—that is, with reference to prognosis—it is important to bear in mind the fact that a very little regurgitation may give rise to a loud murmur; that mitral incompetence may be well tolerated for an indefinite period, and that life may continue for a quarter of a century or longer. These statements are based on cases under the writer's observation.

Let it be supposed that a systolic murmur is present, having its maximum of intensity at the apex, heard, perhaps, over the body of the heart, but not transmitted to the left, nor heard on the posterior aspect of the chest, and the heart not enlarged. There is no evidence that such a murmur is due to mitral regurgitation; the mitral valve may be perfectly competent. This is a mitral non-regurgitant or an intraventricular murmur. Such a murmur is the rule in a primary attack of rheumatic endocarditis, in chorea, in certain cases of anæmia, and sometimes when it has no apparent pathological connections.

A mitral non-regurgitant murmur may persist for a short or a long period and disappear, leaving behind no symptoms or signs of cardiac disease. The writer could cite from his records instances in proof of this statement. The fact is not easily explained if it be assumed, as is generally done, that such a murmur is evidence of mitral incompetence. While it is true, as has been stated, that mitral incompetence may be well tolerated indefinitely, it must be admitted that in not an inconsiderable proportion of cases the incompetence increases more or less rapidly, and results in enlargement of the right heart by dilatation, accompanied by dyspnœa, general dropsy, and ending in death. Hence is obvious the practical importance of the recognition of a mitral non-regurgitant murmur as a sign distinct from a regurgitant murmur. That the discrimination cannot always be made with positiveness, is to be conceded. A feeble murmur, although denoting regurgitation, may not be transmitted to the left, nor heard on the back. On the other hand, it is not certain that a non-regurgitant murmur is always limited to the præcordia, and never

heard on the posterior aspect of the chest. There may be exceptions to the rule, but the rule is not thereby invalidated.

The question will arise in the mind of the reader, How is an intraventricular non-regurgitant murmur to be explained? Here let it be remembered that a well-established clinical fact is none the less a fact because an explanation is not at hand. Autopsical proof of the correctness of an explanation is, of course, not practicable in the cases in which the murmur has existed and disappeared. Supposition must take the place of demonstration in such cases. This remark applies equally to the explanation generally adopted, to wit, that mitral regurgitation actually takes place, and is due either to a lesion from which recovery is complete, or to a functional incompetence from irregular contraction of the papillary muscles or other causes. Nothing can be more purely hypothetical than these suppositions. An explanation which refers the production of the murmur to different physical conditions within the ventricle is not more hypothetical, and it is vastly more rational. These conditions are doubtless varied. Professor Janeway has demonstrated the production of an intraventricular non-regurgitant murmur by a tendinous chord extending from a point within the left ventricle to a point on the opposite wall. In this case the patient had a persistent intraventricular murmur, and, death taking place from a disease having no connection with the heart, afforded the opportunity for the demonstration. Dr. Andrew H. Smith has suggested, as an occasional cause, friction of the mitral curtains upon each other when these are made tense by the ventricular systole.[1] The deposit of fibrin upon the ventricular aspect of the mitral curtains is an adequate explanation in cases of rheumatic endocarditis, and it is a probable supposition that this occurs in chorea and when under other circumstances an intraventricular murmur is developed. This seems a more rational supposition than that or a functional incompetence of the mitral valve. It is also a more rational supposition to attribute the murmur in certain cases to abnormal conditions of the blood. That an abnormal condition of the blood may alone suffice for the production of an intraventricular murmur, is certainly reasonable in view of the fact that such a condition produces murmurs in the arteries and veins. This analogical argument is strong, if not conclusive. It is, moreover, supported by the fact that an intraventricular murmur in cases of anæmia is generally accompanied by murmur in the aorta, the pulmonary artery, and the cervical veins.[2]

[1] New York Medical Record, April 18, 1885; and Journal of the American Medical Association, May 23, 1885.

[2] It is implied in these remarks that an intraventricular murmur referable to blood-changes is produced in the left ventricle. It may be that the seat of the murmur is, in some instances, within the right ventricle. Cases have been reported of a systolic mitral murmur, occurring in connection with pulmonary disease, in which no appreciable lesion at the mitral orifice was found after death. In a case under the writer's observation, of capillary bronchitis, mitral lesions were inferred from a loud systolic

A topic connected with the symptoms of functional mitral incompetence claims a passing notice. The frequency of hæmic murmurs at the base of the heart, and especially emanating from the pulmonary artery, in cases of general anæmia or spanæmia, is well known. It has been conjectured that the murmur usually referred to the pulmonary artery is in fact a mitral regurgitant murmur transmitted into the second intercostal space on the left side by the mitral regurgitant current. This supposition has been elaborately advocated by Balfour, and as elaborately controverted in a more recent and able work by Bramwell. It seems hardly to deserve the space given to it by the last-named author, inasmuch as it involves assumptions which are purely gratuitous and irrational. These are, 1st. That the murmur is not heard at the point nearest to the site of the pulmonary artery. This may be true in some, but certainly not in all, instances. It is equally true that an aortic direct murmur due to aortic lesions, and an aortic regurgitant murmur, do not always have their maximum intensity at a point nearest to the seat of their production.[1] 2d. That functional incompetence of the mitral valve takes place. This is purely hypothetical and improbable. 3d. That, assuming functional incompetence of the mitral valve, the regurgitant murmur has its maximum of intensity at the base; whereas, when incompetence is the result of lesions, as is well known, the maximum of intensity is at the apex. A conjecture so purely fanciful, without a single fact to support it, calls for no more than a passing notice.

An intraventricular and a regurgitant mitral murmur may be combined. Every auscultator of much experience must have met with a systolic murmur consisting of two parts differing in quality or pitch—one part rough and the other soft, or one part low and the other high pitched. The rational explanation is that there are two murmurs, one produced within the ventricle and the other at the mitral orifice.

2. *The mitral presystolic and the mitral diastolic murmur.*

The mitral presystolic murmur has usually a peculiar quality, and this, taken in connection with the time of its occurrence—beginning after the second and ending with the first sound—renders this murmur of all the cardiac murmurs the most easily recognized when its distinctive characters have been clearly apprehended and verified. It is,

murmur, and the heart was found after death free from any evidence of disease. It is a question whether in such instances the murmur be not a tricuspid regurgitant (functional) instead of a non-regurgitant murmur.

[1] A careful observer, Dr. F. C. Shattuck, in an article on "functional murmurs," in the *Boston Medical and Surgical Journal*, July 12, 1883, says: "Balfour finds the murmur of anæmia, as a rule, loudest an inch and a half to the left of the sternal border in the second interspace over the seat of the left auricle. Since I became acquainted with his writings I have examined many cases with reference to this point, and my experience coincides with the almost universal teaching that the point of maximum intensity is usually just to the left of the sternum in the second interspace, or over the third left costal cartilage."

however, to be remarked that the peculiar quality is sometimes wanting, and the recognition must then be based on the presystolic time of its occurrence and its localization at the apex.

What is the explanation of this peculiar quality? The writer has answered this question to his own satisfaction, but the answer has apparently either failed to receive attention from others, or it is not as satisfactory as to himself. That the murmur is produced by vibration of the mitral curtains, caused by the mitral direct current of blood forced by the auricular contraction through a narrow aperture, is shown, *first*, by the character of the murmur. The terms vibratory or blubbering express this character. *Second*, the murmur may be imitated perfectly by the expired breath in two ways. One way is to have the lips in contact and allow them passively to vibrate with the current of air in expiration. The other way is to allow the tongue to vibrate with an expiratory current of air. These imitations illustrate not only the character of the murmur, but the mechanism of its production. *Third*, the murmur may be represented artificially, as follows: Take an India-rubber bag, with very thin walls, of the size of an orange—such an one as is used, when inflated, to make the toy balloon; insert into the opening the efferent tube of a Davidson (Higginson) syringe; make an opening into the opposite end of the bag, of the size and form of a buttonhole; place the bag in a basin of water below the surface; force water through the bag by compressing the bulb of the syringe, and listen with the binaural stethoscope, the pectoral extremity just below the surface of the liquid. Here are precisely the conditions under which this murmur is produced in cases of mitral stenosis.

Clinical observation shows that, as a rule, when this murmur exists with the characteristic quality just referred to, mitral stenosis is produced by adhesion to each other of the mitral curtains, these forming a funnel-shaped space with the so-called buttonhole opening, the curtains not having been made rigid by thickening or calcification. If these conditions be wanting, either the presystolic murmur is not present, or, if present, the vibratory or blubbering character which in most instances is so highly distinctive of it is wanting; the murmur is blowing or bellows-like. It is a clinical fact that a presystolic murmur is not always present in cases of mitral stenosis, and that, when present, it may be a soft, bellows-like murmur. In these instances the conditions for the requisite vibrations of the mitral curtains are absent.

This explanation of the mechanism renders intelligible the disappearance of the murmur at times in an advanced stage of disease of the heart. The murmur requires for its production a certain degree of force in the auricular contractions; the force may be insufficient when from dilatation the muscular power of the auricle is notably weakened. The explanation renders intelligible the clinical fact that, when at times the

murmur has disappeared, it may be made to return by measures to increase the power of the heart's action, such as the administration of alcohol or digitalis.

That the presystolic murmur is due to the auricular contraction, is disputed by some able writers. They attribute the murmur to the ventricular systole, and account for its production by supposing that the murmur is produced after the ventricle begins to contract, and prior to the tension of the auriculo-ventricular valves. The murmur thus, according to this supposition, is intraventricular, and precedes the first sound, for the reason that this sound takes place at the end of the systole, when the auriculo-ventricular valves are made tense. An objection fatal to this supposition is, the presystolic murmur often occupies a longer time than the ventricular systole can possibly occupy. The murmur may be heard during the greater part, and even the whole of the long pause. It cannot be supposed that the ventricular systole is taking place during all this period. Vivisections show that the systole takes place quickly. It is unnecessary to cite other objections.

The not infrequent occurrence of a mitral presystolic murmur, unaccompanied by a mitral systolic murmur, is a noteworthy fact, as showing that the physical conditions for the former do not necessarily involve mitral incompetence. Under these circumstances it is almost certain that the mitral stenosis is caused by adhesion of the valvular curtains to each other, forming a funnel-shaped cavity, the flexibility of the curtains not being impaired. This fact, therefore, speaks for the explanation which has been given of the presystolic murmur, namely, vibration of the mitral curtains. Another fact having the same significance, is the intensity of the mitral valvular sound. This sound is in some cases notably more intense than when the valvular curtains are normal. Every auscultator of experience must have noticed the intensity of the mitral valvular sound at the abrupt termination of the murmur. It is intelligible that the funnel-shaped sac within the ventricle, under the pressure of the blood, should yield a louder sound with the ventricular systole than the mitral curtains in their normal condition. Normally the curtains are floated out and brought into apposition by the filling of the ventricle at the time of the systole. Their range of movement with the systole is less than when they are united to form a cul-de-sac, and, hence, the sound is less intense.

Another noteworthy fact is the long tolerance of the form of mitral stenosis of which the characteristic presystolic murmur is the sign. In several cases under the writer's observation, this lesion has been well tolerated for from ten to fifteen years, the sign having doubtless existed for a greater or less period prior to the cases' coming under observation. In a patient now living and free from any of the grave consequences of obstruction of the mitral orifice, a loud blubbering murmur was ascer-

tained to exist by the writer fifteen years ago. The long tolerance of the lesion, in certain cases, is an important fact to be borne in mind with reference to prognosis. Still another fact to be noted is the existence, not very infrequently, of this lesion when it cannot be traced to an attack of rheumatic fever—that is, in persons who have never had the latter disease. This fact renders it probable that endocarditis occurs oftener than is generally supposed as a complication of other diseases than rheumatism, or as a primary affection.

The author of a late work on diseases of the heart states that a constriction of the auriculo-ventricular opening is always present when a presystolic murmur exists. This statement expresses the prevailing opinion at the present time. That this opinion is erroneous, the writer of this article not only believes, but knows. This strong statement is made for the reason that his knowledge is based on recorded clinical observations during life, and post-mortem examinations in cases in which the murmur existed and the mitral valve was sound.

The first of these cases was observed in May, 1860. The case is very fully recorded. A murmur described in the record as presystolic and blubbering existed at the apex. There was no systolic murmur. A soft diastolic murmur was heard at the base and transmitted downward on the right side of the sternum as low as the ziphoid cartilage. There was no aortic direct murmur. The apex beat was in the seventh intercostal space, on the line of the nipple. Strong impulses were felt in the sixth and fifth intercostal spaces, together with heaving of the sixth and seventh ribs. The carotid, temporal, and brachial arteries pulsated visibly. The veins of the neck were distended, but there was no jugular pulsation. Based on these data, the recorded diagnosis was a button-hole mitral contraction, aortic insufficiency, and hypertrophic enlargement of the heart. The patient, who was fifty-six years of age, died suddenly in his chair. The following is the recorded account of the examination of the heart after death: "The organ weighed sixteen ounces; its circumference at the widest part, over ten and three-fifths inches. About two inches of the aorta were brought away with the heart. This portion was opaque, and roughened by atheroma, but there was no calcification. The artery measured, on a level with the upper margins of the valvular segments, four inches; the pulmonary artery measured three and a half inches. The aortic valvular segments were sound, but evidently insufficient from enlargement of the orifice. The walls of the left ventricle were thickened, measuring at the thickest part four-fifths of an inch. The muscular structure appeared healthy. The mitral valve presented nothing abnormal, except a few small vegetations at the base of the curtains on the auricular aspect. There was no adhesion of the curtains." The heart was exhibited at a meeting of the New York Pathological Society.

The second case was observed in the Charity Hospital, New Orleans, in February, 1861. This, together with the former case, was reported in *The American Journal of the Medical Sciences* for July, 1862. The report is quoted as follows: "I was requested to determine the murmurs in a case at the Charity Hospital, New Orleans. I found an aortic direct and an aortic regurgitant murmur, both murmurs being well marked. There was also a distinct presystolic murmur of the apex, having the blubbering character. On examination after death the aorta was dilated and roughened with atheromatous and calcareous deposit. The aortic segments were contracted and evidently insufficient. The mitral curtains presented no lesion; the mitral orifice was neither contracted nor dilated, and the valve was evidently sufficient. The heart was considerably enlarged, weighing seventeen and a half ounces, and the walls of the left ventricle were an inch in thickness."

A third case was observed in Bellevue Hospital in the autumn of 1882. An account of this case is given in an abstract of a clinical lecture published in the *Lancet* for January 27, 1883. In this case an aortic direct and an aortic regurgitant murmur existed at the base, and at the apex a mitral presystolic murmur associated with a mitral systolic murmur. The presystolic murmur had its usual vibratory or blubbering characters well marked. The case served to illustrate the differential characters of the mitral systolic and presystolic murmurs to clinical classes. The presystolic murmur at different examinations was found to vary in loudness, but it was never absent. Mr. A. P. Gould, of London, who happened to visit the ward with me the day before the sudden death of the patient, listened to the heart as affording a good example of the presystolic murmur. The heart was exhibited in connection with the lecture. It was considerably enlarged, the weight being seventeen and a half ounces. The enlargement was chiefly of the left ventricle. The sigmoid valves of the aorta were thickened and contracted, evidently allowing considerable regurgitation. The orifices of the coronary arteries were much contracted; the mitral curtains were perfectly normal; and the water test showed their competency.

On the basis of these three cases, to assert positive knowledge of the fact that a mitral presystolic murmur may be produced without mitral lesion, does not appear to the writer to imply undue assurance. It is an easy way, putting aside fairness and courtesy, to dispose of these cases, as one author has done, by charging the observer with inability to recognize a presystolic murmur.[1] Inasmuch as this charge has been met in another article (*Lancet*, March 8, 1884), it is only referred to here, adding, however, that the accusation of the error of having mistaken

[1] *Vide* Clinical Lectures on Diseases of the Heart, by George William Balfour, 2d edition, pages 116 and 165

an aortic diastolic for a mitral presystolic murmur, in these cases, is rendered absurd by the fact that in each case an aortic diastolic murmur was noted, distinct in character, as well as in rhythm, from the presystolic murmur. When the accuser has observed as many cases of a presystolic murmur as the writer, with the opportunity of comparing clinical observations with post-mortem examinations, he will, perhaps, be able to report some instances in which this murmur is unaccompanied by mitral lesion.

The difficulty of explaining why, as a rare occurrence, a mitral presystolic murmur without mitral lesion accompanies incompetence of the aortic valve, does not do away with the clinical fact. The writer has submitted an explanation which he will here introduce. He admits, however, fully the force of the objection which has been raised to the explanation by Hayden and Bramwell, to wit, that accepting the explanation, it would be expected, *a priori*, that the murmur should not rarely, but frequently, accompany aortic regurgitation, and should occur even without any lesion of the aortic valve. The explanation which he has given, quoting his own words, is as follows: "The explanation involves a point connected with the physiological action of the auricular valves. Experiments show that where the ventricles are filled with a liquid, the valvular curtains are floated away from the ventricular walls, and, approximating to each other, they tend to close the auricular orifice. In fact, as first shown by Baumgarten and Hamernik, a forcible injection of liquid into the left ventricle through the auricular opening, will cause a complete closure of this opening by the coaptation of the mitral curtains, so that these authors contend that the mitral closure of the auricular orifices is effected, not by the contraction of the ventricles, but by the forcible current of blood propelled into the ventricles by the auricles. However this may be, that the mitral curtains are floated out and brought into apposition to each other by simply filling the ventricular cavity with a liquid, is a fact sufficiently established and easily verified. Now, in cases of considerable aortic insufficiency, the left ventricle is rapidly filled with blood flowing back from the aorta, as well downward from the auricle, before the auricular contraction takes place. The distention of the ventricle is such that the mitral curtains are brought into coaptation, and when the auricular contraction takes place, the mitral direct current passing between the curtains thus in contact with each other throws them into vibration, and gives rise to the characteristic blubbering murmur."

The validity of this explanation, of course, involves the correctness of the explanation of the mechanism of the murmur in cases of mitral stenosis, namely, the retraction of the flexible curtains united at their sides, forming a funnel-shaped sac with a small buttonhole-shaped opening.

Dr. A. T. Keyt, distinguished for his observations in cardiography, has offered an interpretation of a presystolic murmur without mitral lesion, and an explanation of the mechanism of its production, which claim most respectful consideration. Dr. Keyt regards the writer's interpretation and explanation untenable, assuming the mitral curtains to be in apposition at the time of the auricular contraction, for the reason that the

"curtains would be limp and passive, and swayed noiselessly apart, as the blood under the auricular systole passed between them into the ventricle."

He refers the presystolic murmur to the aortic orifice, and gives what he conceives to be the true explanation, as follows:

"In the normal cardiac action the first sound of the heart is heard a notable time after the beginning of the ventricular systole. This is readily demonstrated by employing a cardiograph and a stethoscope at the same time, and giving attention to the play of the lever and the sound of the heart. It will be observed that the lever has nearly or quite completed its ascent when the first sound impresses the ear; the time of this ascent marks the interval between the beginning of the ventricular systole and event of the first sound. The interval is measurable, and may be stated roundly at about one-fifteenth of a second, which is long enough for a practised ear to appreciate." . . .
"When accepting the fact as set forth, that a cardiac murmur preceding the first sound may be audible in certain cases with healthy mitral but insufficient aortic valves, an explanation of the phenomenon is, that the murmur is systolic, and produced at the aortic orifice, and begins before the culmination of the first sound, because the blood is already flowing through the altered valves throwing them into vibration when the heart's note is heard."[1]

This explanation is ingenious. The objections to it are: 1st. The duration of the murmur is longer than the interval between the commencement of the ventricular systole and the first sound. 2d. The murmur has precisely the characters of the mitral presystolic murmur, when undoubtedly due to mitral lesion. This character is peculiar, and rarely, if ever, belongs to an aortic murmur. 3d. The presystolic murmur is limited to an area around the apex, and is not heard at the base of the heart, in this respect differing from an aortic murmur.

The mitral presystolic murmur referred to, for the most part, in this article, is characterized by a peculiar quality, which the writer has distinguished as vibratory or blubbering. It has been stated that this murmur always has this peculiar quality. This, however, is an error. A soft or bellows-like murmur heard at the apex, and presystolic in time, the latter point distinguishing it from an aortic regurgitant and a mitral diastolic murmur, can be no other than a presystolic murmur. Such a murmur is sometimes present in cases of mitral stenosis, the usual vibratory or blubbering murmur being absent.

The mitral diastolic murmur has not as yet gained general recognition as a distinct cardiac murmur. It is entitled to be so recognized. Within the past year the writer has met with several examples, a fact leading

[1] Boston Medical and Surgical Journal, July 12, 1883.

him to suppose that this murmur is not as rare as is supposed. In most of these examples the quality of the murmur has been soft or bellows-like. It has not had the faint musical character mentioned by Balfour, nor could the term *bruit de roulement*, applied to this murmur by Peter, be regarded as appropriate.

As regards its clinical recognition, a murmur which follows the second sound, and ends before the contraction of the auricle, if aortic and pulmonic regurgitation be excluded, may be assumed to be a mitral diastolic murmur. The localization of the murmur is an important diagnostic point. It is heard above the apex and below a horizontal line passing through the nipple. It is probably, with very rare exceptions, followed by a presystolic murmur. It may be distinguished from the latter by a difference in quality as well as in the time of its occurrence. It may, however, have the same character as the presystolic murmur. In some instances a murmur, vibratory or blubbering in character, may begin directly after the second sound of the heart, and continue throughout the long pause, ending with the first sound. In these instances the mitral diastolic and the presystolic murmur exist in combination. This combination also exists if a soft murmur occupies in the same way the long pause of the heart. It is easy to conceive of the mitral diastolic murmur's being overlooked, if it be soft and feeble, when associated with a loud presystolic murmur, especially if the former be not sought after. Moreover, a soft mitral diastolic murmur is liable to be regarded as an aortic regurgitant murmur. This error is probably not infrequent.

A mitral diastolic murmur must be produced by the current of blood from the auricle into the ventricle prior to the auricular contraction. It is intelligible that gravitation when the body is upright, and the *vis a tergo* incident to a distended auricle, give to this current a certain degree of force. If, as some contend, to this force were to be added aspiration caused by an active dilatation of the ventricle, it is surprising that a mitral diastolic murmur is not of frequent occurrence.[1] Here, however, as always in the study of physical signs, clinical observation should be the point of departure. The mitral diastolic murmur claims more attention, clinically, than it has hitherto received. There are points to be studied by observation, such as the frequency of the murmur, its association with other murmurs, and the conditions under which it is observed. A full explanation of the mechanism of its production, although interesting and important, must be secondary to clinical facts.

In conclusion, the following abstract of a case recorded twenty-three years ago is introduced as a probable example of a mitral diastolic murmur. The record of the case is headed "A New Cardiac Murmur."

[1] For a statement of the evidence of an active recoil of the ventricles, *vide* article by J. Lockhart Gibson, M.B., in *Lancet*, April 19, 1884.

"P. C., aged twenty, laborer, admitted into the Long Island College Hospital June 11, 1862. Rheumatism has existed for two weeks before his admission, but he has kept the bed only three or four days. The shoulder-joints, knees, wrists, and the small joints of the hands have been affected. He now has moderate febrile movement. He has a mitral presystolic murmur of the blubbering sort; also a systolic murmur in the left second intercostal space. The presystolic murmur has been made the subject of demonstration to the class in attendance."

"June 17, the presystolic murmur had disappeared. It existed up to the 16th inst. He has now a soft systolic murmur over the apex and body of the heart. Over and around the apex there is a murmur following the second sound, as if the sound were reduplicated; but, instead of a reduplicated sound, it is a rough, short murmur, and it is not at or near the base of the heart. I am at a loss to explain this sign. It follows the second sound after about the same interval as exists between the first and second sound. It is neither diastolic nor presystolic, but occurs at an intermediate period."

"The systolic murmur at the left second interspace continues, and is limited to this space. It is not heard in the right second interspace, and not over the carotid, although in the latter direction the two heart-sounds are distinctly heard. The apex beat is in the sixth intercostal space. He has now no affection of any of the joints, except stiffness. He was up and dressed yesterday, and is so to-day."

"June 20, I have again to-day verified the murmur described above as resembling, in the time of its occurrence, a reduplicated second sound. Its character is that of a murmur, and it resembles the usual mitral presystolic murmur. The order of its occurrence is as follows: First, the first sound of the heart; next, the second sound; and then the murmur; a distinct interval occurring between the murmur and the following first sound. This murmur is limited to a small area around the apex beat. These points are verified by my clinical assistant, Dr. Shiverick."

Seven years afterward, May 19, 1869, the following note was added to the record of this case: "I regard the new murmur described in the foregoing record as a mitral direct murmur, not continuing into the first sound of the heart."

According to the opinion thus expressed, the murmur was a mitral diastolic, as distinguished from a mitral presystolic murmur. If this opinion be correct, the case afforded an example of a rough mitral diastolic murmur, together with a presystolic murmur, the latter disappearing and the former persisting. It is not easy to understand how a murmur of that character could be produced by the current of blood from the auricle to the ventricle prior to the contraction of the ventricle, and a murmur not be produced by the current during the auricular contraction. Assuming, moreover, the correctness of the clinical observation and the interpretation, there must be an adequate explanation, of course, albeit the writer has not a satisfactory one to offer.

IMPERFECT SYMMETRY.

By Sir James Paget, Bart., F.R.S.,

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Few things in nature appear more constant and exact than that symmetry of organic form which is shown in the likeness of the several members of each two or more corresponding and similarly useful parts. The example nearest to each of us is the symmetry of the two side-halves of his own body; it usually appears perfect. And, so far as it can be tested by chemical analysis or by the much more delicate indication of symmetrical diseases, there is a symmetry of composition as well as of shape and visible structure. In substance as in form and size, the two halves appear exactly alike.

And yet it is probable that their symmetry is never quite perfect; never mathematically true. I think that any one who will carefully compare the two or more similar component parts of himself, or of any animal or plant, or any bilateral organ of either, will find, within the general likeness, some unlikeness of size or form, of texture or color, or of all these together. Certainly it is so in the two lateral halves of our own bodies. Just as between parents and offsprings the likeness is general and constant, but never perfect, so is it between the halves of each individual. Invariably nature varies.

The phenomena of symmetrical disease, to which attention was drawn many years ago by Dr. William Budd and myself,[1] are now carefully studied by many; but those of the modifications of disease associated with the defects of symmetry need study too. I have constantly observed them during many years; but, I am ashamed to say, have made no exact records of them, and can, therefore, do little more than suggest some of the lines of study which may yield to others better results than I have gained. The study should include the defects of symmetry or similarity not only of size and shape, but of composition and of rates and methods of development, degeneration, and disease. These are too often dismissed from study when they are called "exceptional cases;" a mischievous phrase if it be deemed explanatory; for I suppose that an "exception" to one rule is only an example of another rule which is as yet unknown.

One of the parts in which defects of symmetry may be most easily seen is the face. Artists know well that the two halves of a face are

[1] Med.-Chir. Trans., vol. xxv., 1842. I do not know who first observed any of them; but one, at least, was painted by that most keen observer of natural forms and expressions, William Hogarth. In his great picture of the Pool of Bethesda, at St. Bartholomew's Hospital, he has represented a woman with symmetrical psoriasis; and not only a bilateral symmetry of eruption but an antero-posterior symmetry of similar patches on both knees and elbows.

very rarely alike. One with the largest experience told me that he had not seen such exact likeness in more than one face in a thousand; another that he had only seen it in "some stupid beauties." Certainly, the defect of symmetry is consistent with remarkable beauty. There is an extreme example of both in the lovely face of St. Mary, of Egypt, by Ribera (Spagnoletto), in the Dresden Gallery.[1] The left side of the face is much smaller than the right and more oblique in its inclination from the median line; the contrast may be observed in any of the numerous photographs of this portion of the picture which are published; but I think that both in these, and, generally, in photographs, the unlikeness of the two sides is less evident than in the faces themselves; perhaps, because of their showing imperfectly the difference of obliquity or of the angles at which the sides recede from the middle.

There is, I think, not much of pathological interest in the defects of symmetry of the head and face; unless in those examples in which there is great inequality between the sides of the skull and a rotation as if it were turned round on the vertical axis. But the defects should be noted; for they often, though not always, correspond with others in the trunk and limbs, and they may help to the understanding of these. They are best seen in the inequality of level and the difference of curves in the eyebrows; in the different degrees of openness of the eyelids, so that the eyes appear of unequal size, whether they be so or not; in the deflection of the antero-posterior plane of the nose; the unequal size and level of the nostrils; the inexactly horizontal line of the closed lips; the difference of the lines at which the two halves of the lower jaw rise from the chin; the difference of the planes of the two sides of the face; the inequality of total size in the two almost equal halves.[2]

All these deviations from general symmetry may commonly be seen; and as often in the most as in the least beautiful faces; and many of them become more marked in smiling, laughing, and other emotional movements.[3] But they have little interest in practice; unless it be in the case of the crooked nasal septum often making it hard to breathe through one nostril and sometimes making a face strange enough to make its owner wish for improvement.[4]

Inequalities of the neck often correspond with those of the face, and are well marked in the sterno-mastoid muscles and the parts near them.

[1] It was no doubt painted from a living model; for the same face is in a picture by the same artist in the Madrid Gallery. But here it is given to another saint.

[2] Imperfect symmetry is usual and very marked in the teeth; but I have not observed them enough to describe them.

[3] The vaso-motor nerve influences by emotions may be similarly unsymmetrical. I saw a girl who blushed on only the left side of her face and neck, and her mother told me that she herself used to do so. The ruddy blotches at the borders of full blushes are seldom similar on the two sides.

[4] I have an impression that these deviations from symmetry are most marked in the most cultivated intellectual races; and more than an impression that, when we reckon among them the variations of colors, the deviations are much greater in domesticated than in wild animals.

The clavicles are often unequal and unlike; but they seldom attract attention, unless when the sternal end of one is larger and higher than that of the other. This is sometimes thought a deformity, and appears the more so when it is associated with more than usual mobility; but, so far as I know, it is unalterable and harmless.

It is difficult to tell in chests which are unlike in their two halves how much is due to unequal respiration in infancy and early life, or to disease, or rickets, or other really morbid conditions. But it is common to see imperfect symmetry even where there is no good reason to suspect any of these causes of it; and it is usually shown in one or both of two ways. In one, the one side, usually the right, is visibly larger than the other. (I say "visibly," because these differences are measurable by a practised eye better than by any instrument used by unpractised hands.) In the other, the chest appears as if slightly rotated on the spine. In both cases there is an appearance which alarms mothers too watchful of their daughters' backs; the scapula on the larger side, or on the side rotated backwards, is more prominent than the other, and curvature of the spine is feared. If the dorsal spinous processes be duly median, showing that the spine is not rotated, though the chest may be, the fear is unfounded.

The appearance of dissimilarity in the two sides of the chest is often increased, especially in girls and women, by greater dissimilarity between the breasts. They are, indeed, very rarely symmetrical in either size, level, shape, utility for nursing, or liability to disease. They are, as truly as any other organs, a pair, yet are they never just alike.

The inequalities of the limbs have been so fully studied that I need only refer to the papers by Dr. Garson, in the *Journal of Physiology*, and to those which he quotes. He shows clearly that the two corresponding limbs are very seldom of the same length; and he proves this by numerous accurate measurements, not only of the whole length, but of the several parts of each. His measurements were made on skeletons, and are more accurate than are any possible in the living body. Yet during life, and in practice, notable differences may be clearly seen and need be well observed.

Difference of volume is often as marked as is that of length, and it is sometimes sufficient to suggest suspicion of disease. But the suspicion may generally be dispelled on finding that there neither is now nor ever has been any other sign of disease in either limb, and that it is difficult to say which of the two unequal limbs is the better or the more appropriate to the other parts of the body.

The difference of length has usually more importance in practice; for it may be associated with appearances of deformity resembling those which are due to really morbid shortenings of a limb, such as may ensue in the defective growths during infantile paralysis, or disease of the hip

or knee, or any similar affection. Many cases of suspected slight curvature of the spine are only examples of the adjustment due to inequality of the lower limbs, and in every such case they should be measured and compared; for the remedy may be supplied by boot soles of different thicknesses better than by spinal instruments. And I think that any one accustomed to estimate horizontal lines and lines drawn at right angles, will make the necessary measures best if, while the body is upright, or as nearly so as it can be, he will observe, while behind the patient, whether his hands resting on the upper borders of the iliac crests are in an exactly horizontal plane. If they are, a well-formed spine will stand at a right angle on that plane.

These examples may suffice to indicate that many much more useful facts than I have told may be collected in accurate records of the inequality of size and shape between the apparently similar pair-organs of the body. And many more may be found in observations of the defective symmetry in composition in the two apparently similar parts on the two sides.

They may commonly be seen in the symmetrical diseases of the skin. The patches of diseases are often not exactly alike on the two sides. Even in the parasitic affection of the epidermis in pityriasis versicolor, the general symmetry of which may be taken as clear evidence of a dependence of symmetry on identity of composition, the spots are not always alike in size and shape. Similar diversities may be seen in psoriasis; and in this there are often noticeable differences of time in the eruptions, that of one side preceding by a day or two that on the other. It is easy to speak of such things as due to chance; it might be right to do so if chance were a form of energy; it will be better to think of them as things of which useful observation may learn the meaning. I cannot explain them; I can tell scarcely more than that these differences in the methods of organic life do not always correspond with differences of shape and size. I know a case in which sweating, whether in health or in disease, is profusely greater on the left side than on the right; the patient is inclined to be left-handed, but the two sides are rather less than usually unlike in size and shape.

THE PRODUCTION OF THE SO-CALLED "ROSE COLD" BY MEANS OF AN ARTIFICIAL ROSE,

WITH REMARKS AND HISTORICAL NOTES.

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The simple untravelled Norwegian, so goes the story, when first brought into the presence of roses, feared to touch them, lest he should thereby burn his fingers. His inexperienced mind was filled with wonder that "trees" should bring forth flames and blossoms of fire, while he held up his hands for warmth before the objects with which he dared not come into contact.

This legend of the North may perhaps find its application in the following case, which, among its many other interesting features, forcibly illustrates the *rôle* of purely psychical impressions in awakening the paroxysms of the disease familiarly known as "rose cold:"

Mrs. ——, thirty-two years of age, in excellent circumstances, surrounded by all the comforts of life; very stout, well nourished, but physically weak; five feet high, with light hair, brown eyes, and fair complexion; nervous temperament. Married for fifteen years, she is the mother of only one child, born three years after marriage. Laceration of the womb occurred during childbirth, and as the result of this accident she suffered from flooding at the menstrual period until two years ago, when an operation was performed on the womb, from which she obtained permanent relief. She volunteered the information, that her uterine trouble had greatly aggravated the head affection, and seemed to increase the severity of the asthmatic attacks. She has always resided in Baltimore. The general temperament of the members of her family is nervous; her father's sister suffers from asthma, and her own sister (a child) from periodic "influenza." In childhood, had scarlet fever, measles, and chicken-pox; in adult life, has been subject to sick headache and neuralgia. From infancy has suffered repeatedly from coryza of unusual severity.

She dates the origin of her present trouble from some time between the sixth and eighth year of life. The asthmatic feature of the case developed subsequently, the first attack appearing at the age of twelve, and since then the disease has been growing progressively worse every year. For fifteen years her sufferings have been intense.

The clinical history of this case is typical. About the latter part of May or the first of June, the disease commences as a coryza. For several days prior to its onset she suffers from an indefinite sense of general depression with a disagreeable feeling of heaviness in the head, which she in part attributes to the worry incident to expectation of the attack. The catarrhal symptoms may or may not be preceded by chilly sensations and general malaise. Their early or late appearance seemingly depends upon the condition of the atmosphere, as regards heat and moisture, and sudden and repeated fluctuations in the thermometer. A

thunderstorm invariably brings on an attack, without regard to season. The catarrhal stage commences with profuse watery discharge from the nostrils, increased lachrymation with redness of the conjunctiva, itching of the puncta, and photophobia. To these are soon added œdematous swelling of the lids, chemosis, and disturbances of vision, which prevent the use of the eyes for reading, sewing, and the like. The nostrils become at once obstructed, the nose itches violently, and paroxysms of sneezing, lasting sometimes for an hour at a time, occur at frequent intervals. The exterior of the nose becomes intensely red, and toward the close of the stage the cuticle desquamates. There is nearly always present a short, hacking, dry, harassing cough, which is relieved by sternutation. With the obstruction of the nostrils, the severity of the symptoms is increased; there is an annoying tickling sensation in the throat, which the patient feels "she must tear out with her nails;" the voice becomes husky, nasal, and easily fatigued; the pharynx feels dry and full, the ears become "stopped up," and not infrequently tinnitus forms a prominent symptom of the stage. The external auditory meatus is sometimes swollen, and the seat of intense itching; occasionally the tissues beneath and behind the auricle are perceptibly swollen. When the stage has reached its acme, there is associated with the above symptoms a *perceptible enlargement of the thyroid gland*, which may be regarded as of importance, in view of the probable vasomotor nature of the disease. To all these phenomena are added a general depression of the spirits and system, constant malaise, incapacity for mental work and household duties, and general irritability.

This state of affairs lasts, with occasional intermissions of comparative comfort, until from between the fifteenth to the twenty-fifth of August (generally the twentieth), when the asthmatic stage sets in. The symptoms detailed above become at this time more prominent, while the most distressing attacks of asthma are added to her sufferings. During the paroxysm it is impossible for her to breathe except in the erect posture. The attack of asthma appears daily, and always at night if she attempts to assume the recumbent position, and varies in duration from one to four or even five hours. During the attacks she is unable to leave the room, and is generally confined to bed.

During the month of September the paroxysms are most severe, but toward the end of the month gradually decrease in severity, and finally disappear. As a rule, she only suffers from the asthmatic feature in August and September; but occasionally the attacks are prolonged until Christmas. The appearance of frost puts a sudden stop to the disease. During the attack the temperature ranges between 100° F. and 105° F.

During her only pregnancy she did not have the disease; the child was born in July, and she did not suffer from her disease until the following October, when she had a slight attack of coryza and asthma. The child lived only five months.

The disease almost always breaks up with an attack of "malarial fever," which lasts for nine weeks, and sometimes for three months; as may be well imagined, the two leave her in a condition of great prostration, from which she slowly recovers. Her last attack was dissipated by a copious eruption of nettle-rash. It may also be mentioned, that during one of her paroxysms she became unconscious, and there was a general rigidity of the muscular system, followed by tremors, which

lasted for several moments, and then passed off. In one attack (the last) congestion of the lungs occurred, which rendered it the severest she had ever experienced.

The paroxysms are excited by the following agencies: (1) A heated, sultry condition of the atmosphere; (2) sudden changes in the temperature; (3) dampness; (4) exposure to "night air;" (5) electrical disturbances of the atmosphere. She can foretell by her sensations the coming of a thunderstorm, and when the latter approaches, the attack is unusually violent, causing her to seek refuge in a closed apartment, when she inhales the fumes of an antispasmodic preparation until the storm is over; (6) exposure to a high wind; (7) sudden excitement; (8) fright; (9) physical overexertion; (10) worry; (11) overloading the stomach: during her disease she has the most voracious appetite, which she is irresistibly compelled to gratify, and in so doing generally brings on a paroxysm; (12) the inhalation of common dust, cinders, and gases, especially those given off in the combustion of coal; (13) the presence or odor of strong perfumes, as, for example, articles of the toilet; the smell of tobacco smoke—anything, in fine, that has a pronounced or penetrating and heavy odor, as the tuberose, lily, etc.; (14) the presence or odor of hay and roses is especially active in exciting the attack. She cannot, for example, remain in a room where roses are kept, or wear them upon her person, without being seized with a violent paroxysm; nor can she come into close or remote contact with hay without the production of a similar result. Last summer, while on a visit to the country, she caught sight of a distant hayfield, when she was immediately seized with a coryza; and on several occasions while passing a haycart in the thoroughfares of the city was taken with an attack of asthma; (15) almost any stimulant, taken internally, such as brandy, whiskey, beer, etc.; (16) handling peaches; (17) the ingestion of fruit; quinia, and morphia.

As a rule, the disease rages with extreme violence only during the heated term—the summer months and September; but exposure to some of the exciting causes produces a modified form of the affection at other seasons of the year, and occasionally in the depth of winter. Occurring at these periods, it exhibits itself as a severe coryza, with slight embarrassment of the respiration, but which soon passes away, and leaves her as before. She never has a paroxysm in cold, frosty weather. During the interregnum of immunity she suffers, and has suffered for years, from a nasal and post-nasal catarrh. During the summer her attacks are aggravated at the menstrual period.

She has tried almost everything known to the profession and laity, including a host of quack specifics, for the relief of her trouble, but without making any impression upon her disease; has also spent several summers at a well-known "hay fever resort" without the slightest improvement in her condition. While on the water and by the seaside she is comparatively free from her trouble, which exhibits, moreover, no appreciable change after removal to the city from the country, and *vice versa*. The only medicinal agent from which she has ever derived comfort is a proprietary medicine composed of well-known antispasmodic drugs. Cocaine, exhibited in the most approved fashion, gives only temporary relief, lasting for half an hour, and leaving her, as a rule, worse off than she was before its application.

On June 1, 1885, she was brought to me, by Dr. Henry Salzer, of this

city, suffering from the symptoms of the first stage detailed above. Although complaining of intense itching in the larynx and ears, those organs were apparently perfectly healthy on inspection. The pharynx, too, presented nothing worthy of remark beyond a slight engorgement of one of the tonsils. The nasal pharynx contained a mass of thin glairy mucus, upon the removal of which the whole region, including the posterior nares and vault, was found in a state of intense redness; the nasal tissues were so swollen that they almost completely occluded the middle and inferior meatuses. Anteriorly, the same swelling and hyperæmia were observed, and the nostrils themselves were filled with a semifluid, glairy mucus. No anomaly of the face or nostrils could be discovered.

Irritation of the anterior segment of the nasal fossa with a probe caused great discomfort, with increase of lachrymation and conjunctival hyperæmia. Pushed further back into the fossa, a fit of severe sneezing and coughing was produced, which necessitated the immediate withdrawal of the instrument. Upon causing artificial contraction of the swollen turbinated tissues with cocaine, an enormous hypertrophic thickening of the right inferior turbinated body was discovered, which extended from its posterior extremity to within a short distance of its extreme anterior limit. In the left nostril there was apparently no well-defined hypertrophic condition. Physical examination of thoracic and abdominal organs negative.

She was placed upon gr. $\frac{1}{16}$ of phosphide of zinc, combined with gr. $\frac{1}{4}$ extract of nux vomica, before meals, and gtt. iij Fowler's solution of arsenic after meals, and was directed to use the following in spray twice daily: ℞.—Acid. boracic. ʒj, pot. bromid. ʒj, glycerin. ℥ss, aquæ ℥viij.—M. The galvanocautery was applied to the most sensitive spots in the nasal chambers on June 4, 6, 8, and 10. By June 15 great improvement in her condition had taken place. The breathing was not disturbed, the sense of smell and taste had returned, the conjunctivæ were normal, and she had experienced no itching about the eyes and nose for several days. She assured me that the cautery was the only thing that had ever given her permanent relief, and although the last application had caused her pain and no little discomfort, she insisted upon its reapplication, as the slight pain incident to the operation was more than compensated for by the permanent benefit she derived from its execution. About ten days later, she was practically free from the disease, suffered no discomfort, although she had been exposed in the meantime to several of the exciting causes of the paroxysms. She seemed confident, however, that if brought into contact with hay or roses she would have an attack, and had, therefore, rigidly excluded the latter from her home.

Decidedly sceptical as to the power of pollen to produce a paroxysm in her particular case, I practised the following deception upon her, which still further confirmed me in that belief. For the purpose of the experiment, I obtained an artificial rose of such exquisite workmanship that it presented a perfect counterfeit of the original. To exclude every possible error, each leaf was carefully wiped, so that not a single particle of foreign matter was secreted within the convolutions of the artificial flower. When the patient entered my consultation-room, she expressed herself as feeling unusually well. The evening before she had attempted

to wear some roses, but had been obliged to remove them from her dress, as they had produced a great deal of discomfort. Apart from this incident, she had been perfectly comfortable for several days and nights. Her conjunctivæ were normal, the nasal passages free, and there was nothing to indicate the presence of her trouble. She conversed with me for some time about her case and on general topics, speaking in the most encouraging manner concerning the progress she was apparently making toward recovery. I proceeded to remove the slight slough from the cautery operation, which lay loose in the nostril, and made an application to the mucous membrane, and all without exciting the slightest tendency to reflex movements. After I felt sure that such tendency was absent, I produced the artificial rose from behind a screen where it had been secreted, and, sitting before her, held it in my hand, at the same time continuing the conversation. In the course of a minute she said she felt that she must sneeze. This sensation was followed almost immediately by a tickling and intense itching in the back of the throat and at the end of the nose. The nasal passages, at the same time, became suddenly obstructed, and the voice assumed a hoarse, nasal tone. In less than two minutes the puncta lachrymalia began to itch violently, the right and afterward the left conjunctiva became intensely hyperæmic and photophobia and increased lachrymation supervened. To these symptoms were added, almost immediately, itching in the auditory meatuses and the secretion of a thin fluid in the previously dry nasal passages. In a few minutes the feeling of oppression in the chest began, with slight embarrassment of respiration. In other words, in the space of five minutes she was suffering from a severe coryza, the counterpart of that which the presence of natural roses invariably produced in her case. An examination of the throat and nasal passages was then made. The right nostril was completely obstructed by the swollen, reddened, irritable turbinated structures; the left was only slightly pervious to the air-current; both were filled with a serous-looking fluid. The mucous membrane of the throat was also injected, but did not exhibit the same amount of redness and irritability found in the nasal passages. As the discomfort was rapidly increasing, and as I considered the result of the experiment sufficiently satisfactory, I removed the rose and placed it in a distant part of the room. When told that the rose was an artificial one, her amazement was great, and her incredulity on the subject was only removed upon personal examination of the counterfeit flower. She left my office with a severe coryza, but also with the assurance that her disease was not altogether irremediable. A few days later, she called to see me again, and on that occasion she buried her nostrils in a large fragrant specimen of the genuine article and inhaled its pollen without the slightest tendency to the production of reflex acts.

HISTORICAL REMARKS.—The dependence of catarrh, coryza, asthma, syncope, convulsions, and a host of other phenomena upon the presence or odor of roses, lilies, peonies, and other flowers, has been recognized for centuries. For, although Pliny[1] informs us that the seed of the rose inhaled into the nostril has the effect of clearing the brain, there are many cases to be found among the older writers, in which the odor of various substances, such as the rose, has been known to result in epilepsy,[2] syncope, and even death,[3] and there is a tradition that the Roman ladies conceived an especial aversion to the odor of the queen of flowers.

In the light of our present knowledge of the affection known as "hay fever," it is scarcely conceivable that it made its first appearance at the beginning of the present century. As Dick, and afterward Matthew Baillie, thought that in describing their first cases of laryngitis they had

[1] Nat. Hist., lib. xxi. cap. 73. The same writer (lib. vii. cap. 7) also observes that the smell of a lamp which has been extinguished will often cause abortion, and that the latter ensues should the female happen to sneeze just after the sexual congress.

[2] The association of epileptiform seizures, or even true epilepsy, with some irritation in or about the nasal passages, or peculiar susceptibility on the part of certain individuals to be thrown into epileptic convulsions through the application of some forms of matter to the nasal mucous membrane, seems to have been familiar from the earliest times. We learn, for example, from Aretæus (De causis acut. morborum, lib. i. cap. 1, Ed. Boerhaave, Lugd. Bat., 1735) that the gagate stone (a species of hard coal or jet) was utilized by the ancients as a test for epilepsy, for when applied to the nostrils the sufferer was thrown into epileptiform convulsions. Pliny (lib. xxxvi. c. 34) also alludes to this test, and to the power of the smell arising from burning goat's horns or deer's antlers in accomplishing the same result (lib. xxviii. cap. 63). According to this historian, the secundines of a she-ass, placed under the nostrils of the patient when the fit is approaching, will effectually dispel it. It is also a curious historical fact that Avicenna (Op. omn., Venet., 1608, lib. iii. Fen. i. tract v. cap. 8, p. 499) also mentions (l. c., Fen. 5, tract 2, cap. 15, p. 585) "rosa cum suis pilis" among the milder measures resorted to to provoke sternutation, and regarded sneezing itself as a mild form of epilepsy (*epilepsia levis*), and that a similar opinion was entertained long afterward by the learned Fernelius (Medicina, Lutetiæ Parisiorum, 1554, de epilepsia). In the seventeenth century, Salmuth (Observationum medicarum centuriæ tres posthumæ, Brunsvigæ, 1648, cent. ii. obs. 13, p. 65, and obs. 60, p. 87) called attention to the fact that paroxysms of epilepsy are often resolved by the eruption of blood from the nose, and related a case of "periodic paralytic tremor," in a woman of 50, dependent probably on a subacute form of catarrh. Several centuries ago, it seems to have been an accepted fact that the odor of, or emanations from, certain plants, notably the rue (ruta graveolens and ruta sylvestris, Dioscorides, Op. omn., Ed. Kühn, Lipsiæ, 1830, tom. ii. p. 515), are capable, when applied to the nose, of provoking epileptic attacks (Sylvester Rattray, in Aditus novus ad occultus sympathiæ et antipathiæ causis inveniendus per principia philosophiæ naturalis, etc., Tubingæ, 1660, p. 34); while Schenck, of Grafenberg, on the other hand (Observat. medicæ de capite humano, hoc est exempla capitis morborum, etc., Basiliæ, 1584, obs. cciv.—case from the practice of Balthazar Conradinus), refers to the case of a rustic who was delivered from epilepsy by the odor of the ruta sylvestris. This writer also reports an interesting case of great redness of the face, convulsions, phrenitis, tremors, and cold sweats, from a slight catarrh (op. cit., obs. xciix.). Finally, Van Helmont (in op. infra citat., p. 110, § 20) makes the broad assertion that certain odors are capable of provoking not only epilepsy, but headache, nausea, vomiting, cough, hiccup, vertigo, apoplexy, dysentery, and other affections; and Portal (Cours d'Anatomie Médicale, etc., Paris, 1804, tom. iv. art. sex, p. 491) observes that he has noticed pains, vertigo, and even epileptic affections in connection with disease of the nasal membrane, and refers to a case accidentally cured by the fumes of cinnabar, given with other intention.

[3] While there is a remote possibility that this observation of the ancients, which finds its reflection in the poetic imagery of Pope, may have some slight foundation in fact, it is extremely doubtful whether, in the cases referred to, death was due to the simple inhalation of the odorous particles of the flower, for in some of the recorded instances the victims were confined to closed chambers, and were possibly poisoned by the displacement of the oxygen of their bedrooms by the noxious exhalations from the plants. It should also be remembered that our less civilized and punctilious brother-man of a few centuries back, did not hesitate to dispose of an enemy through the covert instrumentality of poisoned flowers and other equally insidious devices, by means of which the deadly agent was introduced into the system through the respiratory mucous membrane.

discovered a new disease, so Bostock, in portraying the symptoms of "*Catarrhus æstivus*," was led into a similar error. For no one can arise from the perusal of the older writers on asthma without the conviction, or, at least, the suspicion, that this disease has descended to us through the centuries, as a species of the "convulsive asthma" and "periodic coryza" of the more ancient nosologists, who in their state of medical science did not resort to the nosological refinements which proceed from the more advanced pathological research of the present day and century.

As early as 1557, Amatus Lusitanus[1] related the case of a Dominican monk, who, whenever he perceived the odor of roses or saw them at a distance, was immediately seized with syncope and fell unconscious to the ground. Having consulted a physician, he was advised to remain within doors during the rose season, to avoid the disagreeable effects which they produced. The same writer alludes to other antipathies to the odor of cheese, etc. Amatus Lusitanus has been looked upon in some respects as an untrustworthy observer, but there is no reason why his reliability should be questioned in regard to this particular case, especially as Botal,[2] who wrote a few years later, states that he knew, not one, but *several*, in whom headache, sneezing, and itching of the nostrils lasting for the space of two days, were caused by the odor of roses.

In 1631, Johan Karl Rosenberg[3] published a philosophico-medical treatise on the natural history of roses and their uses in medicine, in which he referred especially to their occasional disagreeable effects upon the organs of olfaction. In the early part of the following century, the subject was again brought forward by Spigelius,[4] who alluded to the frequency of the antipathy to roses and mentiones the celebrated and often quoted case of the Cardinal Oliver Caraffa. This writer also states that the fact of death from the odor of the rose has been sufficiently established by the writings of the ancient physicians.

The various "idiosyncrasies" in regard to olfaction were again referred to, and in the same year, by L. Sennert[5] and Panaroluss.[6] The latter bases his observations on the experience of Frascatorius and relates

[1] Curationum medicinalium cent. quatuor., Venetiis, 1557. Cent. II. cur. 36.

[2] Leonard Botal, Opera omnia, Lugduni, 1565 (vol. containing comment. duo., etc., de catarrho, de fungo strang.,'etc., p. 23). See also Schneider, *infra*.

[3] Rhodologia, seu philosophico-medica generosæ rosæ descriptio, Francofurti, 1631. My information concerning this book is derived from a review of it in the German Miscellanies of Natural Curiosities (Dec. II. Anno III. p. 578, Nurimbergæ, 1685). The older writers refer also to Cromer's History of Poland, to the "Gammarologia" of Sachsius, and to the work of Petrus Servius, "De Odoribus," for examples of accidents from the odor of roses; but neither these works nor the "Rhodologia" of Rosenburg are accessible to me.

[4] Isagogus in rem herbariam, libri duo., Lugd. Bat., 1633—Elzevir edition—lib. II. cap. xi. p. 181, and cap. 13, p. 186.

[5] Practicæ medicinæ, ed. 1654 (Vratislav. ?) lib. I. part II. cap. xxi.

[6] Iatrologismorum, seu medicinalium observationum pentecostæ quinque, etc. Hanoviæ, 1654 Part v. obs. 23, p. 158.

in addition a case of his own, in which the odor of sassafras gave rise to syncope, cold sweats, and general lividity of the surface, so that death seemed imminent. Treated of some years later by Johan Rhodius[1] and referred to by Paracelsus,[2] the antipathy of the nasal apparatus to the odor of roses was discussed at some length by Conrad Schneider[3] in his famous work, *De Catarrhis.*

In the same century, Van Helmont[4] in several chapters of his work discussed the effects of sweet odors in the production of headache, vomiting, epilepsy, and extreme difficulty of breathing (asthma). He also alludes to the fact that, while sweet odors give rise to asthma in some, in others they produce instead of asthma, hemicrania, palpitation, and syncope. This writer regards such disturbances as of frequent occurrence, and is looked upon by some[5] as the first to recognize the affection known as "hay asthma." He explains the mechanism of such attacks by the operation of the "Archeus," on the fantastic theory with which his name is inseparably associated in medical history. Two cases of probable rose cold were related toward the close of the seventeenth century by Binningerus[6] and his contemporary Ledelius,[7] and Pechlinus[8] reported the case of a pharmacist who was thrown into violent paroxysms from the odor of violets in his urine, and was only relieved upon the return of the natural odor to the excretion. The same writer relates another case in which a woman, having taken saffron for some menstrual trouble, was seized with coryza, headache, sneezing, and other annoying symptoms.[9] In the same year a most interesting observation was recorded by Constant de Rebecque,[10] who himself suffered for thirteen years from rose

[1] Observation medic. cent. III., Patavia, 1657, obs. 99.

[2] Opera Omnia—Genevæ, 1658, vol. I. tract II. cap. II. p. 711, b. It is interesting to note that Paracelsus adverts to the subject in his description of the *morbi metallici.*

[3] De Catarrhis, lib. V. cap. I. p. 127—Wittebergæ, 1662. A number of cases, some occurring under his own observation, others in the experience of Botal, Echtius, Tasso, Servius, and others, are related by Schneider, in which sneezing, pustules on the face, catarrh, syncope, epistaxis, and even death resulted from the inhalation of the perfume of roses. The so-called "hay asthma" of the present day may possibly be regarded as allied to, or included in the "suffocative catarrh" of Schneider (lib. V. cap. 4), in which the "membrane lining the nose and mouth, both before and behind, discharges a flux of serum, with which the mouth is constantly filled."

[4] Johan Baptist Van Helmont. Op. omnia, Francofurti, 1682. Imago Fermenti impregnat massam semine, p. 110, § 10, p. 344, § 10, and p. 348, § 41. This author also refers to the case of a monk, employed in pulling down buildings, who grew asthmatic from the constant inhalation of dust.

[5] Bergeron. Thèse d'agrégation, 1872, referred to by Louis Villemsens. Thèse de Paris, No. 404, 1872. Étude sur le cat. spasmodique d'été, etc.

[6] Johan Nicolai Binningerus. Observationes medicinal, cent. quinque, etc. Montbelgardi, 1673. Obs. 86, p. 227. I am indebted for this reference to the work of Dr. Morell Mackenzie—Hay Fever, etc., London, 1885. Third edition, p. 48.

[7] Miscellan. nat. cur., Dec. II. anno I. Obs. 140. This case is not infrequently referred to by the writers of the last century, and also by Phœbus (Der typische Frühsommer Katarrh, etc., Giessen, 1862), and Morell Mackenzie (op. cit.).

[8] Joh. Nicol. Pechlinus. Observationum physico-medicorum libri tres., etc. Hamburgi, 1691, lib. ii. obs. 50, p. 332.

[9] Op. cit., lib. i. obs. xii. pp. 94–96.

[10] This case is taken from the Atrium Medicinæ Helvetiorum (obs. 92, p. 15), published in Geneva in 1691, and is cited by Morell Mackenzie (op. cit.).

coryza, which he attributed, as we learn from Morell Mackenzie, to something which "flows from roses, which stings the nose, and by means of tiny prickles produces a solution of continuity imperceptible to the sight." Rebecque may, therefore, be looked upon in a certain sense as the father of the pollen theory.

In 1696, Dieterich Valentin Kramer[1] collected in an inaugural thesis a number of cases, among which appears the famous one related by Boyle of an English noble, who was so sensitive to the odor of roses that when they were placed near him while sleeping, pustules broke out over his cheek. Kramer also speaks of a physician whom he knew, who was made ill by the smell of roses, and discusses the effects produced by the odor of the lower animals, as cats, dogs, mice, etc., deriving most of his information on the subject from the work of Lemnius.

In 1710, Antoine Rudolph de Voisin[2] published a most careful compilation of cases from the writings of preceding observers, illustrative of the extraordinary effects of the odor of cheese (from Schoockius's "De aversione casei," Johan Faber, Rhodius, and Praevotius), sassafras, cinnamon, orange flowers, lilies (from Scaliger's *Exercitationes*), peonies (Lanzonus, Eph. nat. cur. Dec. II. ann. IX. p. 77), apples (from Bruyerinus's *De re cibariâ*), hyacinthe, amber, musk, saffron, strawberries, and that of different animals, as cats, dogs, mice, etc. De Voisin knew at Basle, a pharmacist "*qui toto illo tempore quo florentes rosæ in suâ officinâ ad varios usus præparantur, ex illarum odore continua fere coryza, non sine crebrâ sternutatione aut capitis etiam dolore, laborare solet.*"

In 1724, David Casper Roehner[3] still further elaborated the subjects handled by Kramer and De Voisin, and added a large number of isolated cases from the German Ephemerides of Natural Curiosities, and from the writings of Cromer, Rosenberg, Scaliger, Dolaeus, and others. This writer informs us that Louis XIV., of France, could not tolerate the smell of the rose. Two years later, Sir John Floyer[4] discussed the relation of the sense of smell to asthma, giving among the causes of the disease, the odor of the primrose. He attributes the difficulty of breathing, however, to irritation of the trachea by the odorous body. Floyer himself suffered "under the tyrrany" of the disease for more than thirty years, and it is interesting to note that the origin of his trouble was a cold, contracted at school; that he never had it at Oxford, but when he went to Staffordshire into his "native air," he was usually visited with a fit or two. He was also more liable to return of his asthma during the month of August. This writer speaks of "an anniversary asthma" (p. 101), which a catarrh precedes and accompanies,

[1] Disputatio med. inaug. de idiosyncrasiis, Helmstadii, ii., 1696, ℥ vii.

[2] Dissert. med. de antipathia humana, in Theodor Zvinger's "Fasciculus dissertationum medicarum selectiorum," etc., Basiliæ, 1710, I.

[3] Dis. inaug. med. de corrigenda idiosyncrasia in stat. præterit. degenerante, Erfordiæ, 1724.

[4] A Treatise of the Asthma, London, 1726, p. 73.

and which terminates in much spitting. "It may be observed," says he, "if the asthmatic catch cold and have a rheum on the teeth, throat, or head, within a night or two the fit will follow," a fact which he explains on the supposition that "the effervescence which usually attends all catarrhs, pushes some slimy lympha on the lungs." He also relates the case of a boy who had asthma almost from his birth, contracted from a cold, which occasioned a great running at the nose and constant wheezing, and who died suddenly at the age of one year and a half, all medicines having failed to relieve him (p. 102).

In 1765 appeared a thoughtful treatise on nervous diseases by Robert Whyte,[1] of Edinburgh, in which he calls attention to the fact that "several delicate women, who could easily bear the smell of tobacco, have been thrown into fits by musk, ambergris, or a pale rose, which to most people are either grateful, or at least not disagreeable" (p. 125). He also mentions similar antipathies in regard to cinnamon and other substances. One year later, Daniel Wilhelm Triller, in his curious work,[2] dwelt upon the so-called iodiosyncrasy of olfaction in regard to roses and violets, and related two cases—one of a noble bride, who sitting surrounded by roses, and weaving them into garlands, became suddenly prostrated, and falling into the arms of her attendant, who rushed to her assistance, was soon lifeless; the other (described at great length), the history of a case in which death occurred from the odor of violets in a closed chamber.

In the edition of his work on exhalations, etc., published in 1776,[3] Robert Boyle treated briefly of the accidents arising from the odor or presence of roses, and toward the close of the last century a number of dissertations appeared on idiosyncrasy in general, in which the antipathy of certain persons to roses is mentioned, and of which the pamphlet of Rahn[4] is the most complete and original.

[1] Observations on the Nature, Causes, and Cure of those Diseases which have been commonly called Nervous, Hypochondriac, and Hysteric. Second ed., Edinb., 1765, p. 125.

[2] Opuscula medica ac medico-philologica. Francofurti et Lipsiæ, 1766, vol. i. Diss. ix. p. 237 *et seq.*

[3] Exercitationes de atmosphæris corporum consistentium; deque mira subtilitate, determinata natura ac insigni vi effluviorum. Lugd. Bat., 1776, cap. vi. p. 213 *et seq.*

[4] Exercitationum physicarum de causis physicis miræ illius, tum in homine, tum inter homines, tum denique inter cetera naturæ corpora sympathiæ secundæ. Turici, 1788.

Those who wish to investigate the subject of idiosyncrasy in general and antipathies of olfaction in particular, may consult the subjoined list of essays and cases, which I have selected from a large number of dissertations, as containing the gist of all that is known concerning the subject. In them will be found many cases, collected from the ephemeral publications and works of writers of the sixteenth and seventeenth centuries, which illustrate the so-called idiosyncrasy of olfaction, and which have not been embodied in the text. The older literature of reflex phenomena dependent upon nasal disease has been given in the introduction to my essay on "Rhinitis Sympathetica." Bartholini (Historiarum anatomic. rariorum, cent. 3 and 4, Hafniæ, 1687, cent. 3, hist. 28); Salmuth (op. cit., circa); Herlinus (Biga remediorum generosorum, sive de remediis sudoriferis, cum præmissis de sudore, etc., Lipsiæ, 1693. Disc. secundus, p. 22, discusses effects of odor of rose, amber, musk, etc.): Hünerwolff (Ephem. nat. cur dec. ii. anno v. obs. 22, pp. 34–35. De catarrho ad nares ex rosarum odore—a famous case); Riedlin (Linlæ medicæ, anno 1695, 177, 178—*vide* Phœbus, op. cit.—case of rose-cold); Johann Samuel Eggers, Diss. med. inaug. de sensibilitate personali, Halæ Magdeburgiæ, 1730, p. 23); Abraham Kau Boerhaave (Impetum faciens dictum Hippocrati per corpus consentiens philologicæ et physio-

It will thus be seen, that the so-called "idiosyncrasy," by virtue of which the presence or odor of certain flowering plants is sufficient to create disturbances referable to the nasal chambers and other portions of the respiratory apparatus, was familiar at a remote period of medical history. In the days when medical writings were published in Latin, the necessity of recording one's observations in a foreign tongue led to a terseness of style and incompleteness of description which often surrounds with uncertainty the exact nature of the cases reported; but whether the records referred to were examples of true vasomotor coryza or not, they may be placed in the same category of affection, and the predisposing influences be considered identical with those provocative of the disease called in the present century "rose-cold."

IDENTITY OF "ROSE COLD" AND "HAY FEVER."—The so-called "hay fever" and "rose cold," may be regarded as the manifestations of a morbid process common to them both—as the grouping together of certain prominent symptoms of an affection for which I have suggested the name *rhinitis sympathetica*, and whose pathology has been discussed elsewhere. The history and conditions of development, the mechanism and symptoms of the paroxysm, are the same in both; and we may, therefore, look upon them as identical. The idea of identity, moreover, not only greatly simplifies the study of this class of affection, but also enables us to approach more nearly the scientific generalization of their phenomena. On the other hand, if we start out with the idea that the coryza excited by roses, or that excited by the emanations from other flowers and grasses, are separate affections, we shall have almost as many varieties of coryza as there are flowering plants in the vegetable kingdom. We should have to speak of daisy cold, pansy cold, violet cold, and so on to the end of the list.

The same thing applies to the nomenclature of the disease based on its assumed occurrence only during certain months of the year, and it were well, therefore, to discard the appellations "June cold," "August cold," etc., for starting on such a basis, we would have a different variety for at least one-half of the calendar months. The so-called June cold often first attacks the patient in August, and the coryza of the latter

logicæ illustratum, etc., Lugd. Bat., 1745); Johann Wolfgang Manitius (Diss. med. inaug. de idiosyncrasia ex diversa solidorum, etc., Lugd. Bat., 1749—general discussion); Roose (Die Krankheiten der Gesunden, Göttingen, 1801); Jacob Davidsohn (De idiosyncrasia dis. inaug., Berolini, 1847); E. F. J. Passement (Essai sur les antipathies, Thèse de Paris, 1811, No. 80); Wagner (Hufeland's Journal, Bd. 33, 1811, St. v. p. 55 *et seq.*—gives, among others, an interesting case of a young lady who was seized with sneezing every time she had the desire to go to stool); August Heinrich Roebbelen (Diss. inaug. med. de idiosyncrasiis, Gottingæ, 1818); Henning (Ideen über Idiosynkrasie, Antipathie u. Krankliche Reizbarkeit, Stendal, 1812); Parreidt, F. H. (Nonnulla de idiosyncrasiis, Halæ, 1835—gives literature); C. B. Heinrich (De idios. diss. med., Bonnæ ad Rhenum, 1841—gives references to rare works); Orfila, Treatise on Poisons, etc., Am. ed., Boston, 1826—mentions pathological effects of the rose, pink, and honeysuckle, pp. 128, 129); Bosquillon's Case (*vide* Girard, Traité de l'Asthme sec et convulsif, Thèse de Paris, 1813. No. 142, p. 9—taken from Cullen's Nosology; also quoted by other writers); Dict. des Sciences Médicales, articles antipathie and idiosyncrasie (containing cases taken mostly from the writers already mentioned); Phœbus (op. cit.) and M. Mackenzie (op. cit.).

month not infrequently makes its first appearance in September or July. Indeed, there is often the greatest irregularity in the period of onset, and this irregularity I believe to be dependent not upon the flowering of plants, but upon certain thermometrical and barometrical conditions.

The more I inquire into the subject, the less importance I attach to the alleged influence of the pollen granule in the production of the paroxysms of the disease. It may be eminently attractive to suppose that the process of plant reproduction calls into being a peculiar principle or substance, so constituted that when brought into contact with an exposed mucous membrane it will provoke profound disturbance of the respiratory apparatus; but such an assumption is opposed not only to reason and fact, but also to nature. If man's relation to the external agents which are made to minister to his pleasure be thus perverted, is it not more rational to conclude that the disturbance arises from some defect in the subject himself, or some disturbance of the sentient apparatus, than from a subversion of the teleological purposes of natural objects?

In the present communication I do not propose to review the etiology and pathology of the disease,[1] but simply to advert very briefly to the psychical factor in the production of its paroxysms. Rousseau has aptly termed olfaction the sense of the imagination, and if we reflect how intimately related it is to the impressions we form of external objects, how it affects our emotions and influences our judgment, the clever definition of the French philosopher becomes all the more striking and felicitous.[2]

The case reported above is, so far as I am aware, unique. In looking through literature, I find that several authors refer to one reported by Thomas Capellini, of a lady, who was made ill by the sight of flowers, both natural and artificial, but the details are not given, and I regret to

[1] My views upon this subject may be found in the following publications: A Contribution to the Study of Coryza Vasomotoria Periodica, or so-called "Hay Fever," N. Y. Med Record, July 19, 1884. Coryza Vasomotoria Periodica in the Negro, with Remarks on the Etiology of the Disease, N. Y. Med. Record, Oct. 18, 1884. Rhinitis Sympathetica, Essay read before Clin. Soc. of Md.; see brief abstract in Maryland Med. Journal, April 11, 1885, and in Internationales Centralblatt f. Laryngologie, etc., Sept. 1885. Observations on the Origin and Cure of Coryza Vasomotoria Periodica, Trans. Medico-Chir. Faculty of Maryland, 1885. Review of Morell Mackenzie's Essay on Hay Fever, etc., The American Journ. of the Med. Sciences, Oct. 1885, pp. 511–528. See also discussion of the subject before the American Laryngological Association (May 14, 1884, *vide* Transactions, p. 113 *et seq.*).

[2] Equally interesting is the influence which civilization exerts upon the development and impressibility of the olfactory sense. Without enumerating, much less elaborating the myriad conditions that conspire to produce such a result, we may safely lay down the general proposition, that the physical and moral forces of civilization—the social and intellectual environment of the subject—exert a marked effect upon the olfactory faculty by inviting or encouraging disturbance of the sentient and perceptive apparatus; that the higher we ascend in the social scale, the more readily our judgments are unnaturally influenced or perverted by impressions derived through the sense of smell, and that the more we recede from the inferior orders, the less perfect and acute this faculty becomes, the more susceptible to irritation, and the more predisposed to disease. In view, therefore, of the importance of olfaction as an avenue through which our mental impressibility is influenced—our imagination perverted—and in view of the relations of civilization to the sense of smell, we can easily understand why it is that this faculty is found more frequently deranged among the superior orders than in those lower down in the social scale and in the savage state.

say that I have been unable to obtain the pamphlet of Capellini, which is entitled *Dissertation sur les Effets des Odeurs*, and which was published in Paris (date unknown to me). While we cannot fail to recognize the important relation of olfaction to the imaginative faculty, and the frequency with which it serves as the connecting link between associated ideas, and while the above case illustrates the psychical element in the *excitation of the paroxysm*, it must not be considered that the affection itself is a disease of the imagination, a purely psychological phenomenon dependent solely upon a deranged mental impressibility. For both our present knowledge of the affection and the history of the case itself, militate against and destroy such a supposition. Indeed, we should distinguish carefully between a disease having a definite clinical history and subject to recognized pathological law, and a mere perversion of the perceptive faculty, although the latter may occasionally act as an exciting influence in the production of the paroxysms of the former. The chief lesson to be derived from the study of this particular case (*i. e.*, so far as the psychical element is concerned) is that it opens our eyes to the fact that the association of ideas sometimes plays a more important *rôle* in awakening the paroxysms of vasomotor coryza than the alleged vital property of the pollen granule.

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MITRAL STENOSIS.

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CONSTRICTION of the mitral orifice is, on many grounds, the most interesting of the valvular affections of the heart. It is common and at the same time dangerous, standing, in point of danger, next to aortic incompetence; being, indeed, the more serious of the two in early life, so that it has a very practical interest. Its clinical history, again, presents peculiarities, some of which have long been recognized, while others have not yet received adequate notice. The special claim of this condition, however, upon our attention, arises from the fact that it presents greater difficulties in diagnosis than any other disease of the valves. It was the last of the valvular lesions to be associated with distinctive physical signs, and it is still not unfrequently entirely overlooked by physicians, while more commonly it is diagnosed as mitral incompetence, which is a far less serious affection. The physical signs are, in fact, extremely varied, and the attempt to elucidate their significance, and especially to attach diagnostic and prognostic meaning to

some of the combinations of modified sounds and murmurs, is the chief object and justification of this paper. Being a contribution to this particular end, historical and other references to the writings on the subject can only be incidental.

A remarkable fact is the relative frequency of its occurrence in women. This comes out whether the basis of the estimate is post mortem or clinical. Of 53 patients dying in St. Mary's Hospital, and examined after death, 38 were females and only 15 males, 72 and 28 per cent. respectively. Of 81 cases collected by Dr. Hayden, 54 were females and 27 males, 66.6 and 33.3 per cent. Dr. Dyce Duckworth in 80 cases found no fewer than 63 women—*i. e.*, 78.75 per cent. It cannot be said that any satisfactory explanation of this great disproportion of women affected by mitral narrowing has been given. It is true that rheumatism is more common in girls than in boys, but were this the only reason, there ought to be a general predominance of valvular disease of the heart in women, and not of this particular condition. Scarlet fever and measles, which are accountable for a certain proportion of the attacks of endocarditis, leading to lesion of valves, are still further from affording the required explanation. Possibly, the greater liability of girls to anæmia at the period of puberty may be one factor in the greater incidence of mitral stenosis in the female sex. Dr. Goodhart has pointed out how anæmia may give rise to valvular disease, and Dr. Sansom, in his *Lettsomian Lectures* (1883), has shown that it is in the insidious and not in the acute forms of valvulitis that mitral stenosis is brought about. These two facts fit together very well into a conjectural explanation of the predominance of this affection in females, especially when it is borne in mind that anæmia and chlorosis are attended with augmented arterial tension, which is in turn attended with increased backward stress on the mitral valves, a recognized cause of insidious damage.

A point on which there is less unanimity of opinion and, therefore, less conclusive evidence, is as to the special liability of children to mitral constriction. Dr. Hayden found reason to believe that such liability existed. Dr. Dyce Duckworth's statistics, on the contrary, do not support this view. The late Dr. Fagge, although he relates no case under ten, came to the conclusion that in children the mitral valve is especially prone to slow inflammation, leading to constriction, and Dr. Sansom speaks of seeing many cases under the age of seven. I have had two deaths at eleven, after protracted illness, and have had more cases of advanced mitral stenosis in children than of any other serious form of heart disease. It is, in my opinion, the most dangerous form of valvular lesion occurring in early life, and that in which there is least chance of compensatory changes sufficient to neutralize the effects of the obstruction to the circulation.

The subjects of mitral stenosis, up to a very advanced stage, have not the look of heart disease; they are neither pallid and anxious looking, as in aortic disease, nor livid and dusky, as in mitral incompetence, but often have a good bright color and cheerful expression, the lips perhaps being of too crimson a shade of red. Not unfrequently, up to the moment when, from some cause or other, serious symptoms have set in, and again after recovery from these, the patient is unconscious of embarrassment of the circulation, and is capable of ordinary work, even when this necessitates going up and down stairs. On the other hand, overexertion may be attended with a distressing sensation of constriction of the chest, so that the patient has to stand still for a moment, and feels as if he were about to die, while hæmoptysis is not uncommon; childbirth and attacks of bronchitis, or pneumonia, etc., bring on serious danger.

Mitral stenosis, moreover, is the form of valvular disease which, independently of actual inflammation or of ulceration, most frequently gives rise to arterial embolism. This is not, as a rule, the result of detachment of vegetations from the valves, but is due mainly to the formation of fibrinous coagula between the musculi pectinati of the auricle or in the auricular appendix; or, more rarely, between the carneæ columnæ of the ventricle, which are shaken out of their beds by exertion or emotion and carried into the circulation. The stagnation which allows of such separation of fibrin may occasionally lead to the production of a large mass of solid coagulum in the atrium of the auricle, which either lies free in the form of a round ball or is attached to the wall of the cavity.

Another condition more frequently met with in mitral constriction than in any other form of valvular affection is great enlargement of the liver with true pulsation of this organ. This is not to be confounded with the jog communicated by the hypertrophied right ventricle, which is much more common. True hepatic pulsation is not a conspicuous phenomenon, but has to be sought for; it is not easily seen and it is scarcely to be felt at all. In order to bring it out, the hand must be pressed upon the enlarged liver at a part remote from the epigastrium and watched, when a gentle but considerable heave will be seen as the organ is distended by the reflux of blood into the hepatic veins. After repeated attacks of congestion the liver often refuses to yield to distention, so that in the later stages of the disease the hepatic enlargement may be less marked than at an earlier period, the result, no doubt, of that form of cirrhosis which is due to chronic congestion.

Related probably to the congestion of the liver is the occurrence of fluid in the peritoneal cavity before œdema is present in the legs, which is not uncommon; or the œdema will disappear speedily with rest in bed while ascites remains for a time; whereas cardiac dropsy, as is well

known, usually begins in the connective tissue, and ascites is late in its appearance, and is associated with extreme œdema.

The pulse of mitral stenosis is interesting. Different observers describe it as regular or irregular, according, no doubt, to the stage of the disease upon which the attention has been fixed. It is, according to my experience, almost invariably regular until the heart is obviously failing, unless the obstruction is complicated by regurgitation, or by valvular affection of the right side of the heart, or by intercurrent pulmonary affections. When irregularity comes on, it is usually at first inequality in the force of the beats, with perhaps slight loss of time in those which are weaker, and not any marked disturbance of the rhythm. Then some of the heart beats will fail to reach the pulse, no doubt from inadequate filling of the ventricle; the action of the heart may thus continue to be regular while the pulse is irregular. When, however, the heart is staggered by some serious pulmonary complication, the irregularity in its action, and, consequently, the irregularity of the pulse, may be indescribable, and it may be impossible to time either sounds or murmurs, or to determine their relation to the systole or diastole. But this is not constantly met with, even when bronchitis, or pneumonia, or pulmonary apoplexy supervenes. Many cases go on to a fatal termination with little or no derangement of the rhythm of the heart, and it is when there is regurgitation as well as obstruction that extreme irregularity is most likely to occur. The pulse, of course, follows the heart, sometimes, however, exaggerating its irregularity, mentioned as above; sometimes, on the other hand, disguising the extreme confusion revealed by the stethoscope. In some rare instances there is only one beat of the pulse for every two beats of the heart, the contraction of the left ventricle at every alternate systole being inadequate to raise the aortic valves. On listening to the heart under these circumstances, the aortic second sound is absent, the rhythm, as expressed by the sounds, being one-two — one, one-two—one. A weak pulmonary second sound may or may not be present—occasionally it is loud. Or there may be coupled heart-beats, one following the other, like an echo, accompanied by first and second sounds of quite different character, so that it appears as if the two ventricles were acting alternately, or one beat may be accompanied by a murmur at the apex, the other not. This curious modification of the rhythm of the heart, however, is not peculiar to mitral stenosis, and when it occurs in this disease it is often, though not invariably, distinctly attributable to digitalis.

But perhaps the most interesting point about the pulse is that the artery, which is rather small, as would be expected, is full between the beats, and presents the characters of moderately high tension—*i. e.*, it can be rolled under the finger, and is not easily flattened. In my experience this modified high-tension pulse is almost constant, and it points

to resistance in the capillaries, but the causes of such resistance is not readily perceived. It may be due to reflex contraction of the arterioles, or the blood may be charged with impurities as a result of imperfect elimination, consequent upon its sluggish movement, which is, perhaps, the most probable explanation, or there may be backward pressure from the veins which makes itself felt through the capillary network.

Another fact which has been impressed upon me, in the course of my observation of the various forms of heart disease, is the late stage at which general dropsy supervenes in uncomplicated mitral stenosis. Not unfrequently the subjects of it are free from œdema at the moment of death, and very commonly it is absent when the symptoms arising from the condition of the heart are most urgent; it may set in suddenly after these have lasted for some time. Ascites, again, may occasionally be present independently of œdema, or it may persist after œdema has subsided, occurrences which are altogether exceptional, if not unknown, in other forms of heart disease. When dropsy comes on comparatively early, regurgitation will usually be found as well as obstruction, and the incompetence of the valve may not improbably play a greater part in the production of the symptoms than narrowing of the orifice.

I have met with an extreme degree of dropsy only when there has been tricuspid stenosis, as a complication of the mitral stenosis, and have come, in the diagnosis of this complication, which in most cases does not reveal itself by separate physical signs, to rely upon blueness and lividity of the countenance, and waterlogging of the tissues and cavities.

This conclusion with regard to dropsy, which is a simple expression of my experience, receives confirmation from an examination of 53 cases, abstracted for me by Dr. Phillips, from the post-mortem records of St. Mary's Hospital, and of the 67 cases related by the late Dr. Fagge in his interesting paper on mitral stenosis in Guy's Hospital reports. Of the 53 St. Mary's cases, anasarca was present in 11, and slight œdema in 1, but in 2 out of 11 there was tricuspid stenosis, and in 7 more mitral incompetence, or some other complication, which in most instances was of itself competent to give rise to dropsy, leaving only two or three to be the effect of mitral stenosis.

In 47 of the cases collected by Dr. Fagge a post-mortem examination was made, and in 7 of these a detailed account of the symptoms and physical signs is given. In 2 out of the 7 there was no dropsy from beginning to end; in 3 others there was fugitive and slight œdema, while the patient was up and at work; swelling of the abdomen preceding, in 1 of these, the pitting of the ankles; in 1 case the dropsy appears to have been marked, but was relieved; in another, it was apparently considerable for a time; but even here it subsided, although present at death.

In this, the only one which at all followed the ordinary course of

cardiac dropsy, it is to be observed that the heart weighed twenty-six ounces, which is an unusual weight in uncomplicated mitral stenosis, and the aortic valves were diseased. In 40 cases the post-mortem notes are brief and the clinical records imperfect, and dropsy is mentioned only in 8, while out of this number 2 were complicated by tricuspid stenosis; 1 by aortic disease, the change in the mitral orifice being comparatively slight; 1 by renal disease, leaving only 4 instances in which uncomplicated stenosis had given rise to dropsy. It is, of course, possible that in some of the 32 cases in which no mention is made of dropsy, this may have been due to omission, but in 11 the history implicitly excludes the condition.

In the remaining 20 cases no examination was made after death, but the clinical history is carefully given, and 15 had no dropsy, and 1 only occasional œdema. Another, however, had an enlarged abdomen. Of the remaining 4, 1 had severe ascites only, which disappeared after paracentesis; in another, ascites appears to have preceded general dropsy; and in the remaining 2, in which cardiac dropsy followed the usual course, a systolic murmur of a kind indicative of mitral regurgitation coexisted with the physical signs of stenosis.

The comparative infrequency of dropsy as an effect of obstruction at the mitral orifice, appears to me to suggest an explanation of the paradox which Dr. Walshe so forcibly puts forth as the outcome of his observation, with regard to the relation between heart disease and dropsy, to the effect, namely, that while universal experience demonstrates the causation of dropsy by heart disease, something beyond and in addition to any one or any group of cardiac lesions is required for the production of the dropsy. His conclusions cannot be summarized without losing much of their weight, due as much to his vast authority as to the concentrated force of the propositions on which they are expressed.

"(1) Mitral regurgitation or obstruction or aortic regurgitation or obstruction may severally exist and for a lengthened period, without systematic dropsy supervening.

"(2) Mitral regurgitation and aortic regurgitation may coexist for years, and yet no dropsy occur.

"(3) Both of these propositions (1 and 2) hold good, whether notable hypertrophy do or do not exist behind, or in connection with the obstruction.

"(4) Simple hypertrophy of the left ventricle may reach the highest point without systematic congestive effects of any kind arising.

"(5) Dilated hypertrophy, even of the left ventricle, may last for years without any such effect ensuing, provided the dilatation be not in notable excess.

"(6) The heart may be in a state of advanced fatty metamorphosis, the pulse feeble and infrequent, the encephalic and respiratory functions exhibit the singular perversions attending a high degree of that disease, the entire organization betray functional languor and inactivity, and yet even the prætibial integuments fail to pit in the least under pressure.

"(7) Or the heart may be soft and flaccid, and the pulse persistently frequent, feeble, and irregular in force and rhythm, and yet no systematic congestions occur.

"(8) The natural relationship of width of the arterial orifices, and also of the auriculo-ventricular orifices, may be materially perverted, without the least systematic dropsy arising until the closing days of life.

"(9) Tricuspid regurgitation, where the right ventricle is in a state of dilated hypertrophy, as shown during life by swollen and pulsating jugular veins which fill from below, and as shown after death by actual examination, does not necessarily produce dropsy."

These are, he says, incontrovertible; he adds:

"I cannot, then, see how the conclusion is to be avoided that something beyond, and in addition to, any one or any group of the cardiac conditions referred to is required in order, as a matter of necessity, to entail the occurrence of dropsy."

And again:

"The existence of some active cause beyond and independent of the heart is further shown by the facts that there is no direct relationship between the amount of heart disease and of dropsy; that dropsy comes on suddenly, sometimes from extraneous causes, the state of the heart remaining, as far as ascertainable, in precisely its previous condition; and that dropsy diminishes and increases, comes and goes, either spontaneously or through the influence of treatment, while the organic changes in the heart remain permanent and unmodified."

The propositions are indisputable, but the difficulties arising out of them appear to have their origin in the implied condition that the effusion of serum into the tissues and cavities of the body is the effect simply of venous stasis and of consequent slowing of the circulation through the capillaries. But it is not a question merely of obstruction in the veins, but of pressure in the capillaries, and if *vis a tergo* in the arteries is wanting, the condition under which the exudation takes place does not arise. Of course, whenever the resistance to the return of blood to the heart is such that the pressure in the arteries is unable to overcome it, actual arrest of the onward movement of blood in the capillaries occurs, and life ceases at once; but, short of this, and subject to the production of the degree of intravascular pressure needed to keep up the nutrient outflow into the intertextural spaces, the movement of blood in the capillaries may be very languid. Given a retarded circulation through the capillaries produced by venous obstruction, the occurrence of dropsy will depend on the pressure of blood in the arteries, and in mitral stenosis the conditions are such as to forbid any augmentation of it. Followed to its source, the pressure in the circulation depends, ultimately, on the left ventricle. Increased resistance in the capillaries is met by the increase of strength and vigor given by hypertrophy, and when disease affects its outlet, compensation is attained by hypertrophy with or without dilatation.

Under certain conditions the left is reinforced by the right ventricle, under all conditions, in fact, in which the pressure in the pulmonary circulation is increased and the right ventricle is hypertrophied, except when such augmented pressure is intercepted by a narrowed mitral

orifice. But in mitral stenosis the left ventricle is not hypertrophied, and, in consequence of the narrowing of the orifice, can get no help from the right, beyond such as is afforded by the more efficient filling of its cavity. The amount of blood entering it is, in advanced cases, probably less than normal, notwithstanding the increased pressure in the pulmonary circulation, and can scarcely at any time exceed the normal. It is not, moreover, propelled into the arteries with increased force. Although then the veins may be full, and there may be every appearance of backward pressure in the capillaries, the real source of pressure in the capillaries is wanting.

It appears to me that a clear recognition of the reason for the comparative absence of dropsy in mitral stenosis tends to remove the necessity for any active cause beyond and independently of the heart.

Before describing the physical signs, it will be useful to review briefly the morbid anatomy and physiology of mitral obstruction. The characteristic effect upon the heart, a dilatation of the left auricle, with more or less thickening (sometimes thinning) of its wall, and great hypertrophy with some dilatation of the right ventricle. The left ventricle is not correspondingly enlarged, and may retain its normal size while the right, by its growth, displaces it backward, so that no part of it appears on the anterior aspect of the heart, and its apex is no longer in contact with the chest wall.

One fact which immediately arrests the attention is the great difference in the weight of the heart and the dimensions of its cavities in different cases. This is due chiefly to the varying degree in which the left ventricle takes part in the hypertrophy undergone by the right.

As a rule, the heart is not very large; it is smaller than in mitral incompetence and *a fortiori* much smaller than in aortic disease. Weights of ten and twelve ounces are common, and fourteen or fifteen will represent about the average. On the one hand, I find weights of seven and seven and a half ounces in adults, and on the other of seventeen and twenty-two ounces. Such differences are not merely capricious and accidental; they have some significance if we were only able to trace it. It is true that similar diversities are common in all forms of heart disease, and are to some extent accounted for by varying nutritional energy, but this is not a complete explanation. Other and often more influential factors, especially as regards their effect in mitral stenosis on the degree of hypertrophy of the left ventricle, enter into their production, and an attempt to follow them out cannot be otherwise than instructive.

Hypertrophy, by means of which the injurious effects of valvular imperfections on the efficient pumping of the blood through the heart are more or less neutralized, is no longer regarded as a vague conservative effect of nature, but is seen to be the response of the muscular

structure of the heart to increased work thrown upon it. Now, when the mitral orifice is narrowed, it is the left auricle and right ventricle only which are called upon to exert increased force, since there is no obvious cause of increased resistance in the systemic circulation. The same may be said when the valvular lesion is mitral incompetence with regurgitation; but here another element of change comes in which makes a difference between obstruction and incompetence. The high pressure in the pulmonary veins and left auricle, which is a result of the damming back of the blood and of the increased force of the right ventricle, causes a forcible inrush into the left ventricle during diastole; and this, so long as the orifice remains of the natural size, must distend, and in the long run dilate its cavity, taking effect, as it does, during the unresisting period of the ventricular rhythm. But an increase in the capacity of the cavity multiplies by so much the force required to expel its contents, and this constitutes a demand for hypertrophy. We have, then, as a result of mitral incompetence, dilatation, and more or less hypertrophy of the left ventricle, but the hypertrophy here is required as compensation for the dilatation, and not to overcome any direct effect of the impairment of the valvular apparatus. In extreme stenosis of the mitral orifice, the pressure which thus affects the ventricle is intercepted; there is scarcely time for it to be adequately filled during diastole, still less for any distending effect to be produced. We see, then, how it is that the left ventricle does not increase *pari passu* with the right. Such, however, is not always the case. The left ventricle is often dilated and more or less thickened, and here our reasoning appears to be at fault. But the difficulty disappears on reflection. Not uncommonly the change in the valves which glues them together and narrows the orifice, interferes at the same time with their apposition, and permits of regurgitation. Such regurgitation may, indeed, be for a long time the predominant result; and, in point of fact, incompetence often precedes considerably the establishment of obstruction. We have here abundant cause for differences in the condition of the walls and cavities of the heart found after death, and, it must be added, for variations in the clinical history, and especially for diversity of physical signs.

But even without regurgitation, it seems probable that in the early stages of the process which ultimately results in great constriction of the mitral orifice, the pressure in the pulmonary circulation may become considerable before the communication between the left auricle and ventricle is so far blocked as to prevent the ventricular cavity from being filled, or even distended, during the period of diastole. There may thus have arisen at an early stage dilatation and hypertrophy, which are utterly inexplicable by the conditions found at death, and we must look back along the whole line of morbid changes in order to understand their final product.

Physical Signs.—As has been already said, these are varied, and sometimes perplexing; but it has appeared to me that they afford a means of estimating approximately the degree of constriction which the mitral orifice has undergone. The contraction does not take place all at once, but increases by slow degrees through many months or years, and it is to be expected that corresponding change in the physical signs will accompany this change of mechanical conditions. The physical signs are not the same in a given case from beginning to end, and by following the modifications of the sounds and murmurs which gradually supervene, I have been led to recognize three stages of the disease.

The heart is not usually greatly enlarged; the apex is displaced to the left and sometimes also downward, but it is found, as a rule, not far from the normal situation.

The hypertrophy of the right ventricle, and the dilatation of the left auricle give rise to an extension of dulness outwards along the fourth and third left spaces, and the dilatation of the right auricle causes dulness up to or beyond the right border of the sternum. The apex beat is not well defined, and in advanced cases is frequently accompanied by a sharp and often powerful shock felt on palpation, which, however, is not a thrust; the impulse of the right ventricle is powerful, lifting the lower left costal cartilages, and making itself seen and felt in the epigastrium

The systole of the left auricle has been said to communicate an impulse perceptible in the third space an inch or an inch and a half from the edge of the sternum, but this is a phenomenon which I have never seen.

Changes in the dimensions of the heart, however, have not the same direct relation to the degree of valvular mischief in mitral stenosis as in other valvular diseases, and it is by means of auscultatory signs that the division into stages is effected.

The pathognomonic sign of mitral stenosis is usually given as a presystolic murmur heard over a limited area to the inner side of the apex beat. It is not a smooth blowing murmur, but has a rough and vibratory character, and is often accompanied by a thrill perceptible to the hand at the same spot. Corroborative evidence is afforded by accentuation of the pulmonary second sound, the result of backward pressure in the pulmonary circulation, and, not unfrequently, by want of synchronism in the closure of the pulmonary and aortic valves, giving rise to reduplication of the second sound.

These are, in effect, the signs in the first stage, but another important note must be added, viz., that the second sound is audible at and beyond the apex. With such a combination of signs the diagnosis is extremely easy; a mumur heard near the apex and followed by a first and second sound can only be presystolic. If further aid were wanted, it would be

afforded by the character of the murmur, which, as has just been said, differs remarkably from other murmurs; it is not blowing and smooth, but vibratory or, in some instances, rumbling. And again, the way in which it runs up to, and suddenly ends in the first sound, which tends to become short and loud, is highly characteristic.

In this stage, that is when with the presystolic murmur both first and second sounds are well heard to the left of the apex, I have never known serious symptoms to arise from the condition of the heart, and I have seen illnesses of different kinds, even serious attacks of bronchitis, passed through without the intervention of embarrassment of the circulation. It is very rarely that patients are admitted into hospital presenting simply the signs above enumerated, but they are frequently met with in outpatient practice, and in consulting-rooms.

The second stage is marked by the disappearance of the second sound at the apex and by the short, sharp character of the first sound, which also usually becomes very loud; the first sound, in effect, comes to resemble a second sound. Mistakes in diagnosis may now be easily made. In mitral stenosis, at this stage, and in mitral incompetence there is alike heard a murmur followed by a short, sharp sound; but in the former the murmur is presystolic in time, and the sound is the modified first sound, while in the latter the murmur is systolic and the sound is the second sound. Very slight attention would, in most cases, suffice to prevent any confusion between the two; but an apex murmur is liable to be set down as the familiar systolic murmur of regurgitation without further investigation, and thus mitral stenosis, the most serious of the diseases of the valves, at a period, too, when symptoms may be impending, is taken for incompetence, which is attended with less danger than any other of the valvular affections. To bear this source of error in mind is to avoid it; but cases are sometimes met with in which, from absence of cardiac impulse and from the similarity between the sounds, it is not easy to follow the rhythm of the heart and time the murmurs and sounds. Flexible stethoscopes are here at a disadvantage as compared with the rigid wooden instrument, which communicates to the ear and head, not only sound, but a sense of shock which at once indicates the moment of the systole, and this when there is no impulse perceptible to the hand. It has been recommended to place the finger on the pulse and to ascertain which sound coincides with the systole, but no guide could be more fallacious. Time is lost between the heart and the wrist, and not always to the same amount; the heart-beat and the pulse are never exactly synchronous, often alternate at equal intervals, and may go beyond this in their want of correspondence. The carotid pulse is a safer guide, but it is not easy for all observers to coördinate tactile and auditory impressions. The most trustworthy method of determining the relation of sounds to the cardiac rhythm is to find a spot in the region

of the base where the first and second sounds are unmistakably recognized, and then from this point to follow the sounds, step by step, toward the apex, when it will be found which of them it is that disappears, or which maintains some distinguishing peculiarity.

It is not, perhaps, of much consequence that an explanation should be given of the modification of the first sound and of the disappearance of the second sound, which are believed to characterize the second stage of mitral obstruction; but an explanation, however imperfect, or even the discussion of a point, may serve to keep it before the mind. The short, sharp first sound to which the presystolic murmur runs up, often with increasing intensity, the importance and significance of which were emphasized by Dr. Fagge, is considered by Dr. George Balfour, who has also done much to bring out the importance of this modification, if I rightly understand him, to be a sort of climax to the murmur, while the murmur is present, and to represent the remains of it when it is no longer heard; but this scarcely seems to be adequate, or, indeed, at all tenable, since the first sound is systolic, and marks, therefore, the arrest of the current of blood from the auricle into the ventricle, which gives rise to the murmur. It might again be plausibly attributed to the state of the valve, interposed like a membranous diaphragm between the two cavities, but this again does not bear critical examination. No very satisfactory explanation, perhaps, can be given at present; there are reasons, however, for ascribing the modified sound rather to the ventricular wall than to the valve: this impression, indeed, is forcibly suggested by the shock communicated to the hand. In hypertrophy the increase in thickness of the parietes modifies the first sound in a reverse direction, rendering it dull and prolonged; in dilatation, on the other hand, it becomes short, sharp, and loud, and comes to resemble that of stenosis, often to a remarkable degree; in palpitation, again, the first sound is very commonly extremely short and sharp.

The suggestion arising out of these considerations is that the abrupt first sound of mitral stenosis may be the result of the imperfect distention of the left ventricle, to which this valvular condition gives rise; the muscular walls at the first moment of contraction meet with no resistance, and acting rapidly are suddenly brought up, and made tense when resistance is encountered, and so produce the sharp first sound. In palpitation, the brief diastolic interval, not giving the ventricle time to fill, has a similar effect.

The disappearance of the second sound at and outside the apex is probably explained as follows: The second sound heard here, in the normal state of the heart, is that of the aortic valves. Of this I have satisfied myself by prolonged observation, the second sound at the apex, and that at the right margin of the sternum, from the third costal cartilage upwards, almost invariably corresponding in intensity and char-

acter, the aortic second sound, indeed, being not unfrequently better heard at the apex than at the base, while that produced by the pulmonary valves, even when accentuated, is not well conducted to the apex of the heart, and is not heard beyond it, unless, indeed, it is audible over a large part of the chest. There are two reasons, then, why, in an advanced stage of mitral stenosis, the second sound should not be heard at the apex; first, that as the left ventricle does not enlarge, it is overlapped by the right, which monopolizes the apex and displaces the left ventricle from all contact with the chest wall, thus preventing it from conducting to the surface the aortic second sound; next, that the aortic second sound is itself enfeebled in consequence of the diminished output of blood from the ventricle; the aorta is not distended, to the normal degree, and the recoil to which the second sound is due is correspondingly weak.

While the altered first sound in which the presystolic murmur ends abruptly, and the absence of the second sound at the apex are, together with the accentuated pulmonary second sound, and the want of accord between this and the aortic second sound, which gives rise to reduplication, the chief indications of serious narrowing of the mitral orifice, there are certain modifications of the murmur not unfrequently met with in advanced stages of this condition, which must be described.

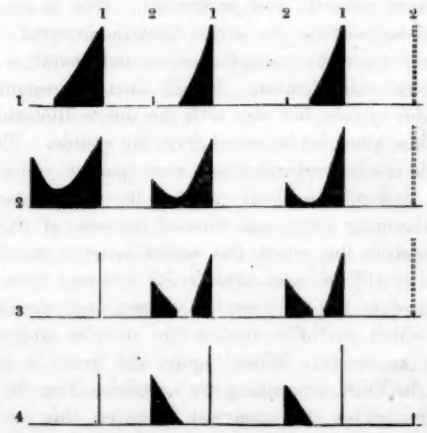
Up to the present, the presystolic murmur has been spoken of as just preceding and running up to the first sound, when it corresponds with the auricular systole, and is the result of the propulsion of blood by the auricle into the ventricle. It is thus a short murmur only, but may be longer—*i. e.*, may begin sooner, when the auricle is hypertrophied and its systole is more powerful and protracted. This is not all, however, for the murmur may occupy the entire diastolic interval, and often follows immediately upon the reduplicated second sound, so that it seems to begin with this reduplication. It will then correspond, not simply with the auricular systole, but also with the active dilatation of the ventricle which takes place on its recoil from the systole. The diastole of the left ventricle is often regarded as a mere passive yielding to the distending force; first, of the blood entering it under pressure from the auricle and pulmonary veins, and then of increase of this pressure by the auricular systole, but when the naked heart is carefully watched, while in action, it will be seen that in its rebound from the extreme contraction of systole, the left ventricle dilates, and exercises a vigorous suction action which partially empties the auricles and causes the appendix rapidly to recede. When, again, the heart is removed by a rapid sweep of the knife, separating the ventricles from the auricles, and the pulsating ventricles are immersed in water, this active dilatation draws in sufficient fluid to yield a copious jet from the aorta and pulmonary artery. The first part, then, of the prolonged murmur often heard when the mitral orifice is greatly constricted is produced by the sucking

in of blood by the ventricle, the last part by the forcing in of blood by the auricle.

It should be added that the first part of the murmur has not always the marked vibratory character of the presystolic murmur proper, but still less has it the soft, blowing character of an aortic diastolic murmur, with which it corresponds in point of time; it may, perhaps, best be described as rumbling.

A further modification arises as follows: In a murmur occupying the entire diastolic interval, attention will usually detect a diminution of its intensity midway, and this may be carried so far that the murmur is cut in two, and the diastolic and presystolic portions are separated by a brief interval. Not only so, but from time to time there is an entire disappearance of the proper presystolic part, so that the obstruction at the mitral orifice is represented only by a true diastolic mitral murmur, which, however, is not likely to be mistaken for the diastolic murmur of aortic regurgitation, as it is almost invariably low pitched and rumbling, and often begins with a reduplicated second sound, instead of being smooth, blowing, and high pitched. Such a diastolic mitral murmur, moreover, is not heard, or certainly will not have its maximum intensity, at the same points as the diastolic aortic murmur, although I have heard it an inch or more beyond the right edge of the sternum in the right fifth space. It may, perhaps, be well to enumerate these varieties of murmur produced by the passage of the blood through a narrowed mitral orifice, representing them diagrammatically. They will be:

FIG. 1.



The double dotted lines represent the reduplicated second stage.

(1) The common presystolic or auricular systolic murmur, which may be short or long. (2) A murmur occupying the entire diastolic interval,

usually diminishing in intensity midway. (3) This murmur cut into two parts: diastolic and presystolic. (4) The diastolic part alone surviving. It cannot be said of these modifications of the obstructive murmur that they specially mark an advanced state of constriction, or that they have any very definite significance, but they are met with only in the second stage, and belong to the period of symptoms, being often associated with evidences of embarrassed circulation. In a young subject they would be of serious importance.

The third stage is marked by the disappearance of the presystolic murmur altogether, so that the sole remaining sign of the condition of the valve, present at or near the apex, is the loud, short, sharp first sound, with or without a systolic tricuspid murmur. This sharp and loud first sound is not unlike that heard in dilatation, with thinning of the left ventricle; but the absence of the second sound to the left of the apex constitutes a diagnostic difference, since this is distinct in dilatation. The absence of murmur and of any very considerable hypertrophy and dilatation may lead to the valvular disease's being entirely overlooked; instances have, indeed, come under my observation in which the heart has been pronounced normal on the eve of embolism or pulmonary complications.

No careful observer who has devoted much attention to the study of mitral stenosis has failed to notice the fact that the presystolic murmur is sometimes absent in cases in which an advanced stage of this condition is found after death. But it is not recognized and taught that this is extremely frequent. It is, in my experience, so common as to constitute a stage in the disease, and a large proportion of the cases of mitral obstruction which are brought into hospital to die would not be diagnosticated if the presystolic murmur were looked upon as a pathognomonic *sine quâ non*, since it may never be present.

It must not be understood that the third stage, as here defined, is necessarily attended with serious symptoms. While this is the rule, patients may for a long time have only the modified first sound described and yet suffer little inconvenience. The principal justification for taking the disappearance of the presystolic murmur as a mark of a distinct stage in the clinical history of mitral stenosis is that, very commonly, when pulmonary complications set in, or other serious symptoms arise, the presystolic murmur is lost, and that it again becomes audible when these subside and the patient improves. It is a matter of repeated and familiar experience for cases to be admitted into hospital on account of serious symptoms with only the short sharp first sound spoken of and to leave with a loud presystolic murmur.

The probable cause of the disappearance of the murmur is the establishment of tricuspid regurgitation; this, at least, is conspicuous in a considerable proportion of cases. The giving way of the tricuspid valve,

and the occurrence of considerable reflux into the right auricle make it impossible for the right ventricle to sustain the same high pressure in the pulmonary circulation and in the left auricle, as was present previously. There is not, consequently, sufficient force in the current through the left auriculo-ventricular orifice, even when reinforced by the auricular systole, to generate sonorous vibrations. There being no valves, the contractions of the auricle will drive the blood backwards into the pulmonary veins as well as onwards into the ventricle, unless the pressure in the pulmonary circulation is adequate to resist the reflux.

The tricuspid regurgitation may or may not be attended with a murmur, but it will be manifested by a true jugular pulsation, and perhaps by hepatic pulsation. If a tricuspid murmur is present, it may become a source of confusion and error in diagnosis. The maximum intensity of the murmur is usually in the tricuspid area over the costal cartilages, just to the left of the ensiform, and over the lower end of the sternum; but not uncommonly the murmur is heard up to the apex, and perhaps even beyond it, so that it may easily be taken for a mitral murmur.

But another source of possible error arises out of the tricuspid reflux. It has already been repeatedly stated that accentuation of the pulmonary second sound is one of the important evidences of mitral stenosis, and this, of course, is due to the high pressure in the pulmonary circulation. When, therefore, the tricuspid valve gives way, and the pressure in the pulmonary artery is diminished, the second sound will cease to present the intensifications previously observed.

There has been so much of digression and discussion in the preceding account of the three stages of mitral stenosis, that it will be well to recapitulate the signs by which they are believed to be indicated, and these signs may at the same time be made more clear by diagrammatic representations of the sounds and murmurs.

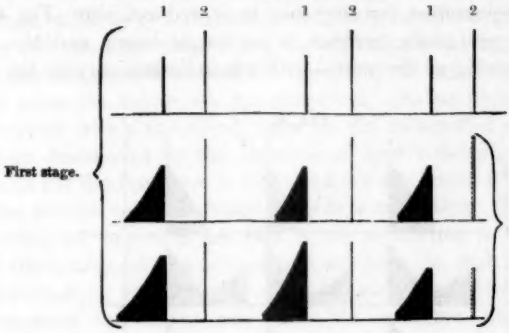
The normal heart sounds may be represented as follows: the short, thick mark standing for the heavy first sound; the taller thin mark for the sharp second sound.

The presystolic murmur attending the first stage of narrowing, then, will be indicated by shading running up to the first sound, which may be made coarse, so as to typify its vibratory character. But the first sound will itself be undergoing a modification tending to render it short and sharp and like the second. The mark representing it, therefore, will somewhat resemble that representing the second, as here shown. Up to this point the recognition of the presystolic position of the murmur in the cardiac rhythm is perfectly easy; followed, as it is, by two sounds, it cannot be misinterpreted.

The second stage is marked by the more or less complete disappear-

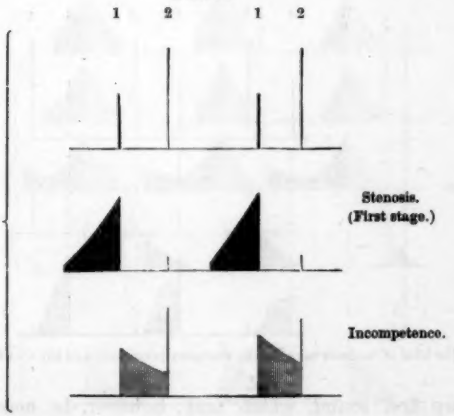
ance of the second sound at the apex, while at the same time the first has become more than ever short and sharp, so as quite to resemble the normal or accentuated second. That is, we hear at the apex a murmur, followed by a sharp sound; the murmur being presystolic, and the sound

FIG. 2.



the highly modified first. But in mitral incompetence, also, we have a murmur followed by a sharp sound, only the murmur here is systolic and the sound the second. The same words, it will be seen, may be used to describe both, and the systolic murmur and second sound of mitral regurgitation being the more common and familiar of the two, it is easy

FIG. 3.



to take the presystolic murmur and modified first sound of stenosis for them. Such a mistake is, in fact, extremely common; but it will not

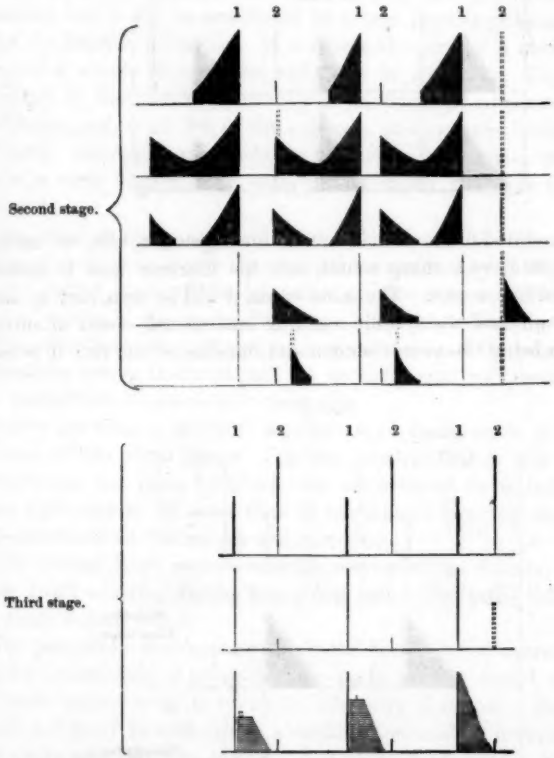
be made if the least attention is given to the character of the murmur, which, in regurgitation, is blowing or musical, and begins with an accent; while in stenosis it is vibratory, and ends in an accent.

These differences are illustrated in the accompanying diagrams, in which fine shading represents the smooth blowing systolic murmur (Fig. 3).

The variations in length and character of the presystolic murmur have already been represented, but they may be reproduced here (Fig. 4).

Finally, the presystolic murmur is no longer heard, and the most advanced narrowing of the mitral orifice is indicated only by the loud,

FIG. 4.



To illustrate the kind of contrast between the vibratory presystolic and the blowing systolic murmur.

short, sharp first sound, which may, however, be accompanied by a tricuspid systolic murmur shown by the horizontal shading.

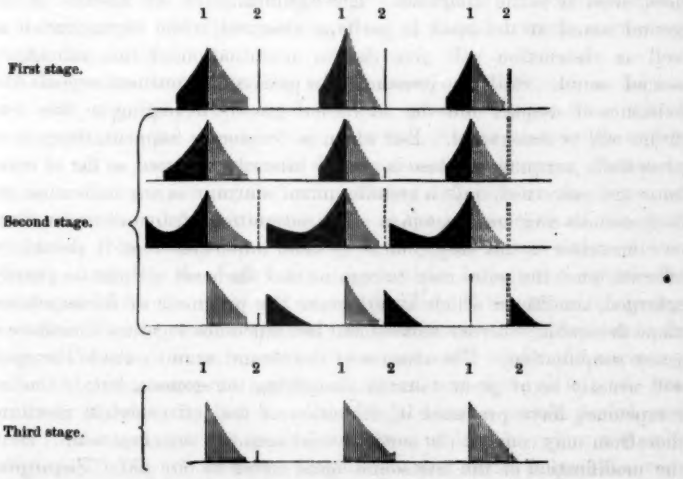
In the foregoing account of the sounds and murmurs attending constriction of the mitral orifice, incompetence of the valve, not un-

commonly associated with it, has been left out of sight for the sake of simplicity in description. It is possible, and, indeed, probable, that in some instances regurgitation takes place without giving rise to audible murmur, and when the heart is examined after death, it sometimes seems as if the irregular or thickened margins of the narrowed orifice could not possibly have come into the close apposition required to prevent leakage, while no systolic murmur has been noted during life.

In such cases the diagnosis of regurgitation as a complication of constriction can scarcely be made. There may, in fact, be no regurgitation even when the valves are not competent. As has been already stated, the course which the blood takes on the contraction of the ventricle will be determined by the direction of least resistance, and in mitral stenosis the fluid pressure in the aorta is a minimum, while the pressure in the auricle and pulmonary veins is a maximum; there may consequently—we may even say that if the circulation is to be sustained, and life is to go on, there must, in some cases, be such resistance in the auricle that no reflux of any moment into it can take place, however incompetent the valves may be. We need not, perhaps, therefore concern ourselves either with the diagnosis or prognosis of mitral incompetence complicating stenosis, which is not revealed by a murmur.

A murmur is, however, often present, and we may thus have a systolic apex murmur superadded to any of the signs enumerated—*i. e.*, in the

FIG. 5.



first stage, at and near the apex, will be heard a double murmur, presystolic and systolic, the former vibratory or rumbling, and leading up to a

short first sound, the latter smooth and blowing in character, beginning with the first sound and followed by the second; in the next stage the double murmur presystolic and systolic, divided by the sharp first sound, is still present, but the second sound is no longer heard at and to the left of the apex. In the third stage there is only a smooth systolic murmur, headed by a sharp first sound; the presystolic murmur, too, is more liable to be lost where there is incompetence as well as stenosis. Almost everything specially characteristic of obstruction therefore disappears, and the murmur only of regurgitation remains. Graphic representations of the sounds and murmurs of the different stages when a systolic murmur is present may be added. No interpretation of them will be needed beyond a glance at the corresponding diagrams on the preceding pages.

The account here given of the murmurs resulting from combined mitral obstruction and regurgitation will certainly seem too simple to those who are familiar with the difficulty of analyzing and recognizing them in practice, and of determining the place of each murmur and sound in the cardiac rhythm. This very difficulty may, if the observer is experienced, constitute a diagnosis, for in no other heart affection does such an extraordinary confusion of sounds and murmurs arise. Sometimes listening at the apex and at the base it seems as if there were two separate hearts beating at a quite different rate.

So long as the presystolic murmur is distinct, no serious uncertainty need arise as to the diagnosis. The significance of the absence of the second sound at the apex is, perhaps, obscured, while regurgitation as well as obstruction will give rise to accentuation of the pulmonary second sound. Still the presence of a presystolic murmur reveals the existence of stenosis and the additional gravity belonging to this condition will be recognized. But when, as frequently happens, there is no presystolic murmur, the case is greatly altered; we have, so far as murmurs are concerned, only a systolic mitral murmur as our indication for both stenosis and incompetence. The recognition of stenosis under these circumstances is not easy, but it is most important that it should be effected, since the pulse may be regular and the heart will not be greatly enlarged, conditions which would make the prognosis of incompetence alone favorable, whereas stenosis and incompetence together constitute a grave combination. The absence of the second sound outside the apex will usually be of great value in identifying the stenosis, but, if the incompetence have preceded it, dilatation of the left ventricle resulting therefrom may conduct the aortic second sound to the chest-wall. Here the modification of the first sound again comes to our aid. Regurgitation through the mitral orifice, it will be remembered, tends to destroy the first sound; stenosis, on the other hand, tends to shorten and exaggerate it, and prevents it from being lost; when, therefore, a systolic

apex murmur begins with a first sound, the question of stenosis, associated with the incompetence, should at once present itself to the mind; usually the sound will have the short, sharp character so often dwelt upon, or some marked peculiarity, and may be accompanied by the peculiar shock felt at the apex; but, even when this is not the case, we may arrive at a diagnosis of the existence of constriction, though it must often remain uncertain to what extent the narrowing of the orifice has gone, or which is the predominant effect, obstruction or regurgitation. It is when both effects are present that we have the extraordinary fluctuations in the physical signs; at one time a presystolic at another a systolic murmur only, and at another both, while the second sound will be reduplicated one day and single the next. It may be conjectured, with some plausibility, that when the pressure in the left auricle is well sustained, its systole is capable of generating a presystolic murmur, and the resistance to regurgitation is efficient; when, on the other hand, it falls below a certain point there is reflex and systolic apex murmur, while the contraction of the auricle does not drive the blood through the opening with sufficient force to produce sonorous vibrations. In intermediate states of pressure both murmurs may be heard.

PROGNOSIS.—Mitral stenosis stands next to aortic regurgitation among valvular affections in the order of gravity. The average age at death, however, as deduced from 53 cases abstracted from the post-mortem records of St. Mary's Hospital, is higher than I expected. This was found to be 33 for males, and 37 or 38 for females; one woman dying at the age of 68 had slight, another dying at 61 had extreme narrowing of the mitral orifice.

A suggestive inquiry is, why mitral stenosis is so serious a disease, and why, especially, it is attended with greater danger than mitral incompetence. One reason will be that the effect of obstruction at this point is not so easily neutralized by compensatory changes. Just as in the case of regurgitation, the compensating influence is the increased pressure in the pulmonary circulation and the hypertrophy of the right ventricle. This antagonizes incompetence of the mitral valve in two ways, by resisting the reflux into the auricle during the ventricular systole, and by more rapid and complete filling of the ventricle during diastole. Now in stenosis the only way in which the high pressure in the auricle and pulmonary veins can neutralize the effects of a narrowed orifice is by increasing the rapidity of the current through it, while the ventricle is relaxed. But the diastole only lasts a certain period, and when the constriction has reached a point at which the orifice will only admit, say the tip of one finger instead of three entire fingers, the ventricle cannot possibly be properly filled in the time available, even under pressure; the compensation, therefore, is inadequate. In aortic stenosis the left ventricle can take its own time in discharging its contents

through the narrowed orifice, the systole is prolonged; there is no corresponding prolongation of the diastole in mitral stenosis. While, however, it appears to be obvious that the provision for compensation falls short of that which comes into operation in other forms of valvular disease, on the other hand, since the narrowing is often found to have attained an extreme degree—such a degree as would in the absence of repeated experience have been thought quite incompatible with adequate circulation of the blood, and since the patients have lived through all the minor stages of the process, taking many months for their evolution, we cannot look upon the nature of the difficulty—*i. e.*, obstruction, and the difficulty of overcoming it by compensatory processes, as constituting the entire explanation of the greater relative danger. It has seemed to me that when once adhesion between the flaps of the valves has set in, there is a tendency for the adhesive process to continue, so as to encroach, progressively, more and more upon the channel. Changes, therefore, initiated by acute rheumatic endocarditis, would in this case be progressive; not, however, simply by continued shrinking of fibrous tissue or organized exudation, but because chronic inflammation is kept up by the friction and strain resulting from the narrowing of the orifice, and gradually glues the margins of the valves together. The process may be compared to the readhesion which it is so difficult to prevent after division of the web between the fingers.

The important point in prognosis, however, is the comparative prospect of life in individual cases, and it is in the estimation of this that the recognition of the different stages is of service.

We have, let us say, in a patient not complaining greatly of cardiac or respiratory distress, mitral stenosis indicated by a presystolic murmur and thrill, with a more or less sharp first sound in the usual situation; there is also an audible second sound at and to the left of the apex. This second sound shows that the disease is in the first stage and that the narrowing is not considerable. It is assumed that the pulse is regular. We should, of course, define the position and note the character of the apex beat, and endeavor to make out the size and form of the heart, directing attention specially to the existence of dulness to the right of the lower sternum and along the third and fourth left intercostal spaces, so as to bring into evidence any distention of the auricles. We may not be able to draw any trustworthy conclusions from the amount of hypertrophy and dilatation, but information on the point is indispensable. The aortic and pulmonary second sounds would be scrutinized and compared; accentuation of the latter will be present, and the degree of loudness and predominance of the pulmonary second sound will serve to indicate the degree of pressure in the pulmonary circulation. Variations in the intensification of this sound, however, move within narrow limits, and they are influenced by so many conditions,

that inferences based exclusively or even predominantly upon them would lead to error. Reduplication of the second sound, showing loss of synchronism between the aortic and pulmonary valves in their closure, is evidence of actual derangement of the cardiac mechanism; but, as it can be produced in a state of health merely by holding the breath, it need not necessarily have any great significance. An accentuated pulmonary and a reduplicated second sound then, while corroborating the diagnosis of stenosis of the mitral orifice by exhibiting effects resulting from it, are not necessarily of immediate serious prognostic import. Nor will the existence of a systolic apex murmur, indicating mitral regurgitation, add greatly to the gravity of the condition, in the absence of symptoms. So long as the second sound is not extinguished at and beyond the apex, the question as to danger relates rather to the future than to the present, and with regard to this, we have to fall back upon our knowledge of the history and tendencies of the disease. The degree of constriction actually reached is probably not dangerous, but it tends to increase, and if there has recently been an attack of acute rheumatism, still more if the patient is liable to frequent recurrence of subacute or slight rheumatism; if, again, the patient is marked by anæmic tendencies, there is every reason to apprehend continuous aggravation of the valvular affection. The younger the patient, the greater the fear of this; partly, perhaps, because of the greater liability to rheumatism. Later, there is the possibility that the mischief may be of old standing and stationary.

It must be understood that while a good aortic second sound at the apex, and along the right edge of the sternum, from the second space upwards, has not in my experience been met with, when serious results of mitral stenosis have been present, or impending, a contradiction of this particular indication by symptoms must always be accepted. No one indication is infallible.

When the second sound is lost at the apex and feeble over the aorta, there may still be a complete immunity from symptoms, under the ordinary conditions and circumstances of life; but there is no capacity for the adjustment of the circulation to deviations from these. We are not, therefore, to be thrown off our guard by the good looks of the patient, and by absence of complaints. Loss of the aortic second sound, associated with a short, sharp, abrupt first sound at the apex, and a reduplicated second sound, the pulmonary element in which is markedly accentuated, warrants a serious prognosis, and all the more when the presystolic murmur is modified in the way described, or is absent. Inquiry will usually elicit evidence of embarrassment of the heart on exertion, and this may assume a serious degree at any moment. An occasion for some extra exertion arises, which may be only slight; the muscular contractions drive the blood in the veins toward the heart,

which is the first step in the acceleration of its movements rendered necessary by exertion; the blood, however, cannot be passed more rapidly through the narrowed mitral orifice, and cannot, therefore, be forced through the lungs; the right cavities of the heart become overdistended, and the patient is at once brought to a state of extreme distress and great danger. In some cases relief is obtained by hæmoptysis, in others this does not occur, or it fails to relieve, and we have dyspnœa, congestion of the liver, and other associated symptoms.

A similar result may be produced by a comparatively slight attack of bronchitis or other pulmonary affection, by any febrile condition, or by anxiety or excitement. The right side of the heart is habitually overtaxed, and any acceleration of the circulation brings about distention of its cavities, with insufficiency of the tricuspid valve, and systematic venous obstruction. On the occurrence of such consequences the presystolic murmur will usually disappear, returning if recovery takes place.

Before symptoms have arisen, the considerations already enumerated as bearing on the question of the probable increase of the obstruction will apply with greater force, since the constriction is assumed to have proceeded further. Recent rheumatism, acute or slight, and any trace of gradually increasing tendency to shortness of breath will be reasons, the one for apprehension, the other for certainty, of progressive aggravation of the state of the valve, while childhood, so far from being favorable, is often the reverse. When this period of life is passed the condition of the heart and of the patient may remain much the same for years.

Anæmia, or obvious debility, will add to the gravity of the condition. Real strength, as tested by power of endurance, and capacity for exertion, will have a contrary significance. In some cases the end is brought about by the constriction reaching a point incompatible with life, in others it is due to want of power on the part of the heart and system to cope with the difficulty.

When symptoms have set in, and we are called upon to form an opinion whether a patient, who is suffering from dyspnœa, pulmonary congestion or apoplexy, venous obstruction, jugular pulsation, enlarged liver, dropsy, and other effects of overdistention of the right side of the heart, will recover from the attack, the first element in the mental calculation will be the severity of the symptoms. But recoveries are witnessed from conditions apparently so desperate that scarcely any combination of unfavorable symptoms can be pronounced absolutely hopeless, if it is the first time the patient has suffered from a similar attack. The number of times, then, that complications have arisen in the case, and the readiness with which they have been provoked, become considerations of the first importance. If the patient has had repeated attacks, and if a very slight cause has sufficed to set up serious symptoms, the danger is very great. It has seemed to me an unfavorable sign when, under such circumstances,

the liver does not enlarge; this is evidence of cirrhosis from previous congestion, and a reservoir for venous blood is lost. Advanced dropsy is always a very serious matter in mitral stenosis.

A complication of mitral stenosis sometimes met with is tricuspid stenosis. Tricuspid regurgitation is extremely common; it arises out of the mechanical and hydraulic conditions set up by the narrowing of the mitral orifice, the damming back of the blood in the lungs, the consequent high pressure in the pulmonary circulation and resulting stress on the right ventricle; it does not create a new difficulty, but serves as an indication and measure of the old difficulty. With regard to stenosis of the tricuspid orifice the case is different; it is not the direct outcome of antecedent mitral obstruction, and when present it adds a new source of obstruction to the circulation. What it is that gives rise to it can only be a matter of conjecture. The reason why the valves of the left side of the heart are so much more frequently the seat of disease than those of the right is apparently that the strain upon them is so much greater in consequence of the higher pressure in the systematic circulation. In mitral stenosis, the strain upon the pulmonary and tricuspid valves becomes probably quite equal to the normal strain upon the aortic and mitral valves, and this perhaps may account for the occurrence of tricuspid valvulitis and stenosis, especially when there are recurrent attacks of rheumatism.

However this may be, it is a fact of clinical observation that narrowing of the tricuspid orifice is more commonly met with in association with narrowing of the mitral orifice than with any other valvular affection of the left side of the heart, and when it supervenes it constitutes a most formidable complication.

It is consequently very important that it should be recognized early. This I have not found to be an easy task. A perceptible tricuspid murmur is described, and interesting cases in which it has guided to a correct diagnosis are related. I have myself heard what I believed to be a presystolic tricuspid murmur; but, on the other hand, I have frequently had cases under my care in which tricuspid narrowing has been diagnosticated during life, and demonstrated after death, without any such murmur having been recognized although repeatedly and carefully sought for.

The grounds, then, on which the existence of obstruction at the tricuspid orifice may be inferred are a degree of blueness of the face and lips unusual in uncomplicated mitral disease, and liability to coldness and dusky lividity of the extremities. There will be great distention of the jugular veins, but less pulsation in them. Dropsy also becomes a more marked feature, and indeed in my experience extreme general dropsy in which all the tissues of every part are laden with fluid is not met with as an effect of obstruction at the mitral orifice unless there is also tricuspid narrowing.

TREATMENT.—The treatment of mitral stenosis is conducted on the same general principles as obtain in other forms of heart disease.

Considering first the important period before the disease is so far advanced as to give rise to serious effects, and symptoms are absent or induced only by overexertion, the damaged organ must be protected from any undue strain at the same time that nutrition of the tissues generally is kept up. The great difficulty is to reconcile these two conditions, which are more or less conflicting; but this only affords an opportunity for the exercise of the common-sense and clinical sagacity which are indispensable in the physician. It would be as mischievous to the patient as it would be insulting to the medical man to lay down strict rules. All that is necessary is to offer such suggestions as arise out of the special tendencies of the particular form of disease, which must be adapted to the enormous diversity of individual cases, constitutions, and habits. We must, however, look before us, and not wait for the recognition of such tendencies till symptoms compel our attention to them.

The patient's avocation and mode of life generally should be interfered with as little as possible, unless his habits are such as are distinctly injurious. Restrictions which go beyond the mark may of themselves impair the health, or they may render the sufferer's life unnecessarily anxious and miserable, or they may provoke reckless reaction.

Common-sense precautions must be taken against rheumatism and catarrh, or other effects of cold, but there should be no cultivation of a susceptibility to changes of temperature by excessive care. Flannel or other woollen material should be worn next the skin, sitting or standing with wet feet or in damp clothes must be avoided, as must draughts and hot, close rooms. It will be desirable to send a patient out of a climate or district conducive to rheumatism, and to forbid an occupation attended with much exposure.

In the matter of exercise there should be no violent exertion, and fatigue should not be carried to the point of exhaustion. Any effort which causes pain in the chest, or marked dyspnœa, must be looked upon as harmful, and must be avoided. Short of the above, the more the patient can be out of doors, and the more exercise he can take the better, and it will often be found that by beginning gently he will easily attain a rate of walking which, if attempted in the first instance, would have brought him to a standstill; or he may mount an incline without distress which at his ordinary pace would have been impossible. He may even be permitted to bathe and swim if experience shows that he bears it well. It is not prudent to send patients suffering from this or any other form of heart disease to mountain resorts. The effects of the diminished atmospheric pressure cannot be foreseen in individual cases; it is apt to set up palpitation, and should unfavorable symptoms supervene, removal—which is imperative—may be difficult and dangerous.

We would gladly add, were it of any use to do so, that anxiety and depressing emotions ought to be excluded from the patient's life.

The food and drink may be liberal and varied, but they should be distributed as equably as possible among three meals, not one of the three being specially large. If the nourishment for the day is taken at one huge repast the vessels are at one time filled, perhaps to undue distention, by the absorbed products of digestion, and then gradually unduly depleted. Such extremes throw unequal work upon the heart, to which disease renders it less able to adapt itself. There is, again, the liability of the distended stomach to carry up the diaphragm and so directly embarrass the heart by pressure. While the inclination, digestive powers, and idiosyncrasy of the patient should be duly regarded, it is important that fruit and farinaceous and other vegetable articles and milk should enter into his diet so that it may not be too nitrogenous. Further, due regard must be had to the fact that excess of any kind beyond the actual requirements of the body tends to the accumulation in the blood of nitrogenized waste which may act as an irritant, and will certainly give rise to resistance in the arterio-capillary circulation, one of the influences most to be dreaded in the long run.

Constipation must never be permitted. Both the mechanical and the chemical effect of fecal accumulation are injurious.

Medicines, except for the correction of functional derangements, and the prevention or removal of anæmia or debility, are not required, and being unnecessary will, if given habitually, be injurious.

When symptoms set in, excluding embolism, which will not be here dealt with, they will be either pulmonary complications due to the effects of the obstruction in the pulmonary circulation, or they will be further effects of such obstruction upon the right side of the heart. The treatment will not be really different in the two cases—nor will it usually be possible to distinguish between them, since the additional stress thrown upon the right ventricles by the occurrence of pulmonary apoplexy or congestion will generally break down the valvular competency of the tricuspid.

The danger to life consists in the inability of the right ventricle to force the blood through the lungs. Both ventricle and auricle become extremely distended, so much so as to be almost paralyzed by overstretching of the muscular fibres in their walls. When the tissues of the heart have undergone degeneration, or when the right ventricle is worn out by protracted overstrain, death may be sudden, either as the result of an effort or motion, or without obvious exciting cause. The fatal termination is, indeed, very frequently abrupt and unexpected, but it is not sudden death while in apparent health, but in the course of illness. The symptoms of overdistention of the right side of the heart are sufficiently conspicuous and familiar: urgent dyspnœa, with more or

less duskiness or lividity of the face, which, however, even at this period may not be extreme; cough, which may or may not be attended with hæmoptysis, and a small, weak, and irregular pulse, many beats of the heart not reaching the wrist, and in extreme cases scarcely any. The contrast between the weak pulse and the powerful impulse of the heart is very striking, but the impulse felt is that of the right ventricle only, and there is no proper apex beat. The jugulars are distended and pulsating, and an indication, not always looked for, but of the greatest importance and significance, is enlargement of the liver, which may be felt to extend below the umbilicus and across the epigastrium to the left hypochondrium; it is nearly always jogged by the violent contractions of the right ventricle, and may pulsate from reflux into the hepatic veins. Associated with this there may or may not be a slight amount of effusion into the peritoneal cavity; anasarca need not be present, though sometimes it supervenes suddenly while the struggle is at its height, or even when improvement has begun.

Under such circumstances the first and most important thing to be done is to relieve the right ventricle. There are three ways of effecting this: by venesection, cupping or leeching, and purging. Bleeding from the arm or jugular is the most prompt and effectual, and it is certain to come again into more general use as the profession becomes familiar with the remarkable results which may be witnessed in cases apparently hopeless; pulselessness, cold extremities, and the cold sweat of impending dissolution are not contraindications as long as there is power in the laboring right ventricle. While blood is abstracted on the one hand, brandy and other stimulants may be administered on the other; or in desperate cases ether or brandy, or both, may be injected under the skin. It is in private practice that the best opportunities for successful bleeding are met with. In the case of hospital patients there is usually a smaller reserve of strength, and the rest, warmth, care, and nourishment they receive, to which they are strangers outside, make such a difference in their favor that milder measures are sufficient. Leeches may therefore be employed, or cupping, with or without the abstraction of blood. A very suitable situation for the application of leeches or the cupping-glasses is over the enlarged liver. It is not supposed that blood is abstracted from the organ, but the pain usually present in the region of the liver and the sense of fulness and oppression are relieved. After leeches the bleeding may be encouraged by poultices. I have seen recovery so far as to allow of the patient's leaving the hospital after the application of eight leeches in a girl of thirteen, when not only was she cold, pulseless, and apparently moribund, but when stasis in the capillaries of the surface had actually begun, giving rise to large livid patches on the abdomen and elsewhere.

As an accessory to the abstraction of blood in the attainment of the

same object, viz., the diminution of the afflux of blood to the overdistended right ventricle, or as the principal means of effecting it, purgatives are to be employed. A mild aperient will be of no use; the purgation must be decided. Nor is it, in my opinion, a simple matter or purgation to be induced by any method which may happen to be convenient. A mercurial pill or powder appears, according to my observation, to have a greater effect in reducing the liver and relieving the right heart than more powerful purgatives of another kind.

As has been already said, there is no incompatibility between the depleting agencies just described and stimulants.

Stimulants, indeed, are often required, but until the right side of the heart is relieved, neither stimulants nor the remedies which act upon the heart will have a proper effect. They may, on the contrary, do harm; and much as the frequent and irregular action of the heart may appear to call for digitalis, the administration of this or similar drugs had better be postponed till the stress upon the right cavities of the heart has been relieved by the bleeding or purging.

Digitalis may then be given, at first with ammonia, ether, and belladonna; afterwards with nux vomica or strychnine; or, again, with tincture of iron. Convallaria, or caffeine, may be substituted for digitalis when the latter appears to disagree with the patient or fails in its effects. Caffeine, however, in my hands has been of much greater value taken at the same time with digitalis than in place of it, a profuse flow of urine withheld up to that time, coming on when the caffeine has been added. It is scarcely necessary to repeat, what is so well known, that diuresis is the most certain evidence of the beneficial effects of digitalis. But it may be added that it is not the increased secretion of urine which does the good. It is in itself only one of the various secondary results of the improvement in the circulation, showing, as it does, that pressure has been lessened in the venous and increased in the arterial side of the capillaries, and that the rate of movement through them is increased.

Other diuretics, squills, scoparium, juniper, the salts of potash, find their place as accessories or as alternatives, when digitalis and caffeine, or convallaria, have been taken so long that they begin to lose their effect.

In mitral incompetence digitalis may be given almost indefinitely, and patients often take it for years with obvious advantage, but such is not the case in mitral stenosis. Here the effects must be watched from day to day; at any time the action of the heart may all at once become disordered, many of its beats not taking effect on the systemic circulation, and failing to produce a pulse in the radial artery; the heart may be acting with fair regularity, and at the normal rate, when the pulse is rendered irregular in this way; or its rate may be slackened, and its rhythm disturbed, the effects of which will be exaggerated in the pulse.

It is not uncommon to have established under the influence of digitalis the apparently alternating systole of the two ventricles already mentioned, so that quite regularly there will be two beats of the heart for one of the pulse, pulse and heart sometimes alike acting regularly; but more commonly, the heart-beats being coupled, a weaker beat following a stronger one at a briefer interval, giving on auscultation the sounds one-two—one (silence) one-two—one.

This derangement of the heart's action is usually accompanied by a sense of oppression and distress in the region of the heart, and sometimes by nausea, and frequently the liver will be found to be swelling again. The digitalis should be at once suspended; afterwards a repetition of the mercurial aperient may enable the heart to bear it again, or its place may be taken by some of the other remedies enumerated.

AFFECTIONS OF THE EYE ACCOMPANYING MUMPS.

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The implication, either concomitantly or by a process of metastasis, of other and distant organs during an attack of mumps, is a well-known peculiarity of that disease. The method of this transference is, I believe, one of the many questions pertaining to that obscure disease that yet remain to be solved by the general pathologist.

The testicle in man, and the mammary gland in woman, have been recognized from the earliest history of medicine as the objects of this metastasis of disease from the parotid glands; and within late years the ear has been discovered to stand in a similar unfortunate relation. That another important organ of sense was in danger from this usually mild and innocent affection I was not aware until the following case fell under my observation:

Case I.—Frank W., a colored boy of fifteen, applied to me for treatment on July 25, 1885. He stated that the mumps had been going the rounds of his family, and that he had a slight affection of the *left* gland. On the third day of the disease he got wet, and two days after he noticed that his right eye was affected. On the fourth day of the eye trouble he applied to me. I found the upper lid much swollen, and he was unable to elevate it. On raising it I found the cornea intact, but there was a considerable clear chemosis of the conjunctiva at the outer and inner portions: the pupil was dilated, but not ad maximum, and there was paralysis of accommodation. There was diplopia in the upper, lower, and extreme left fields of fixation, and the upward and downward move-

ments of the eye were visibly restricted. There was a noticeable exophthalmos. V.$=\frac{4}{18}$; V. in L.$=\frac{4}{4}$. Ophthalmoscopic examination showed the media to be clear and the outlines of the disk sharp, but there was a marked tortuosity of the retinal veins. He was advised simply to bathe the eye in hot water.

On the 28th the lid was much less swollen, and he could raise it somewhat. The restricted movement was about the same in upper fixation field, but was improved for below; pupil smaller; chemosis almost gone; some slight exophthalmos. Ophthalmoscopic appearances unchanged. V.$=\frac{4}{6}$.

Aug. 1. Pupil smaller and accommodation slightly restricted. Diplopia at about 20° up and down from the central point of fixation, and at the most extreme left field; ptosis better. V.$=\frac{4}{5}$. Tortuosity of retinal veins not so great. The patient was not seen after this, from which I infer that he went on to a recovery more or less complete.

At the time of making this observation I could not call to mind any reference in my reading to similar cases, but considering the evidence very strong as to the connection between the parotid and eye affection, and in view of the absence of any other justly assignable cause, I searched the literature at my command to find, if possible, some support for my conviction.

The text-books on medicine and ophthalmology are alike silent on the subject, as are also the journals devoted exclusively to ophthalmology. A reference, however, to a paper in a French journal of military medicine, fortunately put me in possession of eleven cases of a similar character, and as these are the only mention I can find of the subject, and as the journals in which they appear are probably accessible to but few general practitioners or specialists in this country, I think it not amiss to give brief abstracts of the cases.

The first reported cases are those of M. Hatry.[1] These were observed during an epidemic of mumps among the troops stationed at Lyons, in which there was an unusual number of metastases to the testicle.

CASE II.—Man, twenty-four years of age, taken with mumps on March 24th. Admitted to hospital on account of visual trouble on the 31st. At that time there was a bulbar conjunctivitis and a headache. On the tenth day of the affection the parotid swelling was better, but there was much swelling of the upper lids; V. F. and color perception good; no photophobia; V. on both sides $\frac{2}{15}$. In both eyes there was cloudiness around the optic nerve entrance, which was redder than normal. There was an extraordinary turgescence of the arteries and veins, and there was venous pulsation. There was suppura-

[1] Considérations sur des troubles visuels observés avec l'alterations de la papille et de la zone peripapillaire chez les malades atteints d'orreillons pendant l'hivir, de 1875-76. Par M. Hatry, Med. Maj., 1st class. *Recueil des Mém. de Méd. et de Chirurg. Mil.*, 3me series 32, 1876, pp. 306-316.

tion of the submaxillary region. The ophthalmoscopic signs gradually subsided, and on the 15th of May V. $= \frac{4}{5}$.

CASE III.—Man, aged twenty-four. Examined on the third day of the disease, V. $= \frac{2}{3}$. No sign of eye complication except a slight conjunctivitis, redness of the disk, and circumpapillary haziness. In seventy days these signs had disappeared, and V. $= \frac{5}{6}$.

CASE IV.—Man, aged twenty-three. V. $= \frac{2}{15}$ in both eyes; lids swollen; injection of conjunctiva of ball and lid; photophobia; strong injection of the papillæ, with ill-defined edges. In fifteen days all these symptoms were gone.

CASE V.—Had metastases to left testicle with severe constitutional disturbance. Papillæ veiled. In eight days papillæ normal. V. not tested.

CASE VI.—Patient a man aged twenty-five. Metastasis to testicle on ninth day of the disease; papillæ injected with infiltration of the peripapillary zone. V. $= \frac{1}{5}$ L., $\frac{2}{3}$ R.; V. F. and colors good. In five days all symptoms were gone.

CASE VII.—Man twenty-four years of age. Examined on ninth day of the disease. V. normal, conjunctivæ normal, injection of papillæ and enlargement of retinal vessels.

CASE VIII.—Man aged twenty-six. Slight palpebral conjunctivitis. V. $= \frac{1}{2}$ R., $\frac{2}{3}$ L. Injection of papillæ, with diffuse borders. In fourteen days the ophthalmoscopic image was normal. V. $= \frac{4}{5}$.

CASE IX.—Man twenty-three years of age. V. $= \frac{2}{3}$ L., $\frac{2}{3}$ R. Congestion of conjunctiva of lids; papillæ congested, with ill-defined borders; vessels much enlarged. In ten days all signs had disappeared. V. $= \frac{5}{6}$.

CASE X.—Man aged twenty-three. V. $= \frac{1}{2}$ L., $\frac{1}{20}$ R.; papillæ injected, particularly on external half; diffuse borders; enlarged retinal vessels; injection of palpebral conjunctiva. In twelve days there was a complete disappearance of all symptoms.

CASE XI.—Man twenty-four years old. Metastasis to testicle. V. $= \frac{1}{2}$ in each; deep injection of disk; veins double their normal size, and very tortuous; arteries tortuous and large; well-marked zone of peripapillary infiltration. In fifteen days eyes normal.

The only other case I have been able to find on record is the one by Talon,[1] from whom I got the reference to those of Hatry.

CASE XII.—This was also in the person of a young soldier who had double mumps, the swelling being greater on the left side. On the fourth day of the disease there was metastasis to the right testicle. Both the mumps and orchitis improved until the twenty-seventh day, when V. in the right eye became affected. There was pain in the frontal region, and a sensation of gravel in

[1] Observation d'atrophie du nerf optique consecutive á des orreillons, by M. Talon, Med. Maj., 1st class. *Archiv. de Méd. mil. et de Pharm.*, 1883, i. pp. 103–109. Lest any one else may be misled in the same way as I was, I would state that the name is incorrectly given in the bibliography in vol. xiv., Nos. 3 and 4 of the *Archives of Oph.*, as *Jalon*, and the page 109, instead of 103.

the eyes, and a slight conjunctivitis. On the twenty-ninth day the pupil was dilated and unaffected by light; there were also great cephalalgia, vertigo, and nausea. V. $= \frac{1}{10}$. Ophthalmoscope showed the papilla much injected and ill-defined in outline, with a peripapillary injection extending four or five mm. from the disk; veins large and tortuous; arteries enlarged; urine healthy; no history of syphilis. Dr. Terson examined the patient and pronounced it optic neuritis. The case went on to atrophy of the nerve and complete abolition of vision.

From a study of the cases reported up to the present time, we find that the principal parts of the eye to suffer from a metastasis of the mumps to that organ are the lid, conjunctiva, and optic nerve, and also in my case the third pair of nerves. The exophthalmos present in my case I think due mainly to the paralysis of the ocular muscles, allowing the cushion of the orbit, by its elasticity, to push the ball forward, though it seems highly probable that there was at the same time a serous infiltration of these tissues, as there was of the conjunctiva and lid. The disease may be unilateral and of varying degrees of intensity. The prognosis of the affection seems to be, in the main, good, the only case terminating in blindness being that of Talon. This, however, suggests the possibility that some of those atrophies of the optic nerve, especially when unilateral, which are accidentally discovered, and the origin of which cannot be traced to any of the hitherto recognized causes, may be due to a metastasis of mumps in childhood.

As regards pathology, anything in the way of explanation must, from the paucity of accurately observed data, be merely speculative. Hatry and Talon look upon the eye trouble as consecutive to a cerebral complication. It seems to us, however, that this could not be possible in all the cases reported. It is hoped, however, that the publication of these cases may be the means of calling the attention of both the physician and ophthalmologist to a new field for their combined observation and study.

ON RECENT GYNECOLOGY.

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This century has been, and continues ever more and more to be, a period of rapid development, not in medicine alone, but in every department of human activity. Standing in the whirlpool of religious, political, mercantile, and medical change, one is disposed to think the times are revolutionary, and have overstepped the limits of law or of the ordinary or justly expected rate of change or of progress. But it may not

be so. The next generation of philosophers will then be equally astonished and puzzled in the embroilment of their time, and will look back on the distant view of what they may regard as the pleasant settled peace of ours.

The increase of medical science, in mere bulk, in recent and specially in our own times, has compelled men, and as it goes on will increasingly compel men, into what are called specialties. In an important sense this is an evil, but it is an inevitable evil. Human time is limited; the powers of our mental faculties are limited; and it is a vain lament that we cannot, when very hungry and thirsty, devour and assimilate the fine food which science so copiously and daintily prepares for us. The time of Admirable Crichton is left far behind; but the advantage and superiority of the medical man who has most of his quality will always remain. Hope of remedy for the Babel confusion lies in the discovery of a common tongue. The deserts and mounds of chips of knowledge may be brought into subjection to general, and yet more general, laws, and the utmost perplexity of details be reduced to order and made an easy study.

At a period now remote, medicine was itself a specialty. When the universities were founded, one chair was enough for it and all its departments. When hospitals were founded, there was no classification of patients. A century ago the whole library of midwifery and diseases of women was comprised in a few volumes; and there was no library of gynecology; while it is surely now no exaggeration to say that a single year produces as much obstetric and gynecological literature as all the ages before the century began. In London, midwifery and gynecology are now, but only now, beginning to be taught systematically; it is recognized that thirty or forty lectures are inadequate for the display of the subject. The diseases of the fœtus and of newly born children await a fuller development, lying now in the position of a mere appendage to midwifery. Medical jurisprudence is separated from midwifery. Gynecology, or diseases peculiar to women, long a neglected appendage to obstetrics, is nobly struggling into recognition and importance. Already it owns a large and growing library, special departments in great hospitals, and minor hospitals of its own. And yet it has not, in Great Britain, special teachers.

It is not to be wondered at that in these circumstances, a contemporary should find himself in a maze of difficulties when he attempts to estimate the present position of gynecological science, and to appraise the numerous novel proceedings which spring up luxuriously on the newly turned soil. Time and research will try and purify the science; wisdom and experience will cleanse the field of practice from innumerable weeds; and, as we have already said, the retrospective glance of the medical historian, seeing the diligence, the progress, and the achieve-

ments of our time, may, only by special inquisitiveness, discover the weedy part of the growth which now entangles and embarrasses and perplexes us. Activity is not necessarily, and certainly not all, progress. An American orator has recently discoursed to the New York Academy of Medicine on the great power of mere restlessness and of love of money. It is gentler and nobler motives that impel the triumphant car of true stable gynecology.

There is a well-known ancient distinction between medicine and surgery, as imperfectly defined as it is ancient. Medicine has always taken precedence, and will always take precedence, for the head and its work are nobler than the hands and their work; and yet who can draw the line between the work of the one and of the other? Where is the opening for jealousy to intrude between the physician and surgeon? Both have ample scope for the highest powers of the mind. Young men, men of enterprise, men of action, turn naturally to surgery. Maturer years, study, research turn to physic. Wisdom in a physician, skill in a surgeon. Gynecology is partly medical, partly surgical; and its practitioners fall into the two ranks, or nearly so. Every gynecologist is, to some extent, a surgeon; but it is rare to find the qualities of physician and surgeon highly developed in the same individual. In the great field of general medicine, the distinction is here and there maintained between the two sets of practitioners; in the lesser field of gynecology, there is as yet scarcely room for both anywhere; and there is, consequently, at least an appearance of jealousy between those affecting gynecological medicine and those affecting gynecological surgery.

If it is difficult to separate by a definite boundary medicine from surgery, it is still more so to draw a line between ordinary and general medicine and gynecological medicine, and between ordinary or general surgery and gynecological surgery. A lasting distinction will not be made on any preconceived plan, nor fostered by any arguments. We have no record of any plans or any arguments in the now ancient separation of general medicine and surgery; it will grow up on Darwinian principles. The fittest for the times will survive. Science will send forth branches in unforeseen directions. The public will have the practitioner who suits them best. The ovariotomist or hysterectomist who is most successful will sweep most into his net, whether he be a general, or a gynecological surgeon; and so it should be. In the interior of hospitals, especially of the great old establishments, there seems to be room enough for gynecological medicine, and gynecological surgery has found a considerable unchallenged area for its work. But the surgeons have, in some of them, claimed ovariotomy and hysterectomy, refusing to resign them to new gynecological members of the hospital staff. The surgeons have the advantage of ancient position and respected rights. The gynecologists have the advantage of youth, growth, and prosperity.

The matter may be left, without anxiety for the future, to its destiny, which is not as yet manifest. Whichever way the ultimate decision, in hospital or in private practice, may fall, no evil will accrue to gynecology or to surgery. Meantime, the great ovariotomists and hysterectomists of Great Britain show, neither in their history nor in their renowned progress, any more special connection with or devotion to obstetrics and gynecology than do their purely surgical colleagues. They seem disposed rather to fall into general surgery than to adopt gynecological surgery. Much has been said of the special adaptation of obstetricians and gynecologists to their special departments of surgery, and a little force may be permitted to this argument in favor of gynecologist's claiming to themselves the field of gynecological surgery. But there is only a little force in it; there is only one set of surgical principles. One man may find it suit his genius to devote himself to the eye, another to the ear, another to the bladder, another to the ovaries, another to the uterus. But it is not necessary to hand over the surgery of the liver to a Murchison, or of the uterus to an Arthur Farre, or of the lungs to a Williams.

The reviewer of modern gynecological literature must express his admiration of the zeal and the diligence of the students and the consequent copiousness of the production; and undoubtedly the best is from Germany. The *Archiv für Gynaekologie* is a repertory of gynecological science, hitherto not approached in excellence by any other production, and is fit to be proudly placed beside any other scientific journal of the world. But we must look at the second-rate and the more bulky, as well as at the first-rate and more condensed, and we are bound to notice the failings.

It is almost needless to remark, that the more of science and the more of scientific method, the better the literature. Without truth there is no science, and without love of truth there is no scientific method. In gynecology there are lamentable aberrations from truth, inexcusable, not even to be palliated, and scarcely to be mentioned.

Quite in a different category are erroneous assertions, foolish exaggerations, and bad science. The world lives on theories, and bad science implies bad practice. Without truth there can be no science; without high morality there can be no good practice, and little progress in practice. Morality, accuracy, and good science must, therefore, be fostered as the bases of good practice. If examples of foolish assertion and bad science are wanted, we have only to refer to the history of "ulceration," with its speculums and caustics, now happily shrivelled into just proportions. Or we may refer to the history of displacement and the ridiculous spurious epidemic of displacements and of pessaries. Or we may look at the injury to women, apparently already half averted, from trachelorrhaphy, founded on such absurd statements as that at least one-half of

the ailments among those who have borne children are to be attributed to lacerations of the cervix. Or we may turn to the cures by oöphorectomy and by the Weir Mitchell method; to a very great proportion of which the cynical yet true remark may be applied—the women had no diseases and they were cured. "Quidquid delirant reges, plectuntur Achivi." To think on these matters does not cause pain and indignation such as are excited by the previous category, but it causes sadness, and stimulates the desire to improve gynecological science and practice.

A third category demands consideration, and even respect, on account of its imposing character. We have said that the world revolves on theories; and the more general the principle involved the more important are the dependent theories. Long looking for a philosophical basis for the facile adoption of practices, dangerous out of due proportion to the dangers of the relative diseases, we failed to find any, however much we might shrewdly suspect its existence. At length, in a transatlantic address, it made its appearance from the mouth of an eminent gynecologist. It consists in the asserted importance, if not even the paramount importance, of pain as compared with life; or, in other words, for the relief of continued suffering, a considerable proportion of lives of the sufferers may justly be sacrificed.

An analogous question has been raised in regard to operations of complaisance—that is, for conditions involving no danger to life, and has been discussed by Velpeau. Such operations are for the removal or diminution of deformity and disability, and their establishment has been deliberately sanctioned or forbidden under the venerable principle, that life is of higher value than anything else.

The extension, in our times, of dangerous operations of complaisance and of dangerous operations for relief of pain, is, of itself, almost sufficient evidence that the stringency of the principle is not felt now as it once was. And it is for medical philosophy to decide as to the propriety of this loosening of the venerable restriction.

Justice demands the execution of individual criminals; statesmen send their fellow-countrymen to death in hosts; but, in these cases, there is solemn public judgment, and the nature of the objects aimed at is quite different from that of the aims of medicine. The judge and the statesman look to the interests of the public; the surgeon to the interests of the individual alone.

The obstetrician is permitted, on his own responsibility, to destroy fœtal life. In most cases there is the preliminary question, easily solved, of the comparative value of the two lives, that of the fœtus and that of the mother. This being settled, the obstetrician may, unchallenged, destroy fœtal life to save maternal life. When the decision is not simple, both the profession and the lawgivers look upon destruction of life with the utmost jealousy. It may be remarked that there is, at present,

a strong and widespread fear that, even within professional circles, sufficiently jealous guardianship of embryonic and fœtal life is not duly maintained, and, in passing, we may express our feeling of debt to Goodell for his eloquent remarks on this subject in a recent lecture.

Surgery has to consider individuals only, and is still generally held bound to act under the old-established principle of the paramount value of life. But there are many difficulties, for danger is a matter of degree, and diseases and individual cases have great difference in respect of danger to life.

All operations are dangerous to life; and we have no scale of the danger of diseases and the correlated justifiable danger of the relative operations. But such a scale has already some beginnings, and we do not despair of reaching valuable approximations in precise numerical form.

In most cases there is, fortunately, no difficulty. It is easy to decide in favor of ovariotomy. It is easy to decide against oöphorectomy in most of the cases in which it is at present, or has recently been proposed. It is difficult to come to a decision in most cases of proposed hysterectomy, and we may refer to the records of experience by Thomas Keith for just remarks and wise counsel on this subject.

The physician may have an easy decision to insist on operation, or to insist against operation; and in such circumstances he is content to stand alone. But, in cases of difficulty, he may often, with advantage, lay the question before his patient for her opinion, and be even content to let it be decided by the patient.

The preceding remarks are made with reference, exclusively, to the saving of life. But now we have to consider the new doctrine of the value of pain, and we find ourselves in insurmountable difficulties, solved only by recurrence to the old and venerable and safe principle of the value of life.

If pain becomes the test, then the patient, not the physician, is the judge. If pain is the test, then any case may be operated on. Who will define pain for this purpose? Who will define endurance? Who will prescribe just limits of endurance? Who will skilfully detect those

> "Oppress by some fantastic woes,
> Some jarring nerve that baffles their repose,
> Who press the downy couch while slaves advance
> With timid eye to read the distant glance;
> Who with sad prayers the weary doctor tease;
> To name the nameless ever-new disease;
> Who with mock patience dire complaints endure,
> Which real pain and that alone can cure?"
> . . . . .

The recent progress of gynecology has been mainly surgical. Much has been done in gynecological pathology whose practical application in

relief of suffering or management of disease is of great value, and of wide applicability, but the triumphs of surgery, though comparatively limited in utility, engross the general gaze. This gynecological surgery does not stand isolated, but forms part of general surgical progress, and some leaders in the gynecological department, as Mr. Lawson Tait, perform exploits on the male, and in regions remote from those of gynecologists.

We have spoken of surgical progress and also of surgical license, and dismiss the latter with the remark that, if the motive is pure from selfishness, there is only a little room for rebuke. A generous surgical enthusiasm is like any other, attracting admiration as it pursues its boisterous career, although here and there it overflows the limits of sobriety. The main current is beneficent, and time will soon bring moderation and the stoppage or withdrawal of the overflowings.

Generous ambition, and fair rivalry, and the spirit of the times, have given the impetus to the accelerated progress of gynecological surgery. Here, and in all we have written, we regard only the great doings, the real progress, with its errors of enthusiasm. But the spirit of the times has thrown to the surface much else of surgery, included under the designation of minor gynecology. Of this there is not a little that is praiseworthy, but not enough to call for a laudatory review. The good is overwhelmed by the fussy residue, which has its natural and full and longed for equivalent in copiousness of filthy lucre. The child and the parent of crude physiology and cruder pathology, it delights in new tools and new remedies, or remedies with new names; speculums, caustics, pessaries, pads, and metrotomes, all of never-ending variety, meddling and muddling; inventing and making cures; exciting the disdain of the nobler brethren; a frivolous theme scarcely worthy of the pen of an able editor of a journal of the very latest Parisian fashions.

Recent gynecology, whether major or minor, owes much to the spirit of the times; but major gynecology has had powerful prospering favorable gales from recent discoveries. We may safely affirm, that without the anæsthetics of America, and the antiseptics of Lister, recent gynecological surgery could not have attained its great position. To foresee the danger unattended by the agony makes a ready, willing patient. To foresee the great source of danger, and to provide against it, embolden the surgeon.

Among the more adventurous spirits of gynecological surgery there is a risk of obliteration of the distinction between feasibility and advisability. They have proved that any operation is feasible, and now they have more difficult tasks; as, for instance, to show what operations are advisable, and how they may best be done, and when they may best be done. At what period in a case should ovariotomy be undertaken? Are there any cases besides those of uterine hemorrhage immediately

imperilling life in which the operation of Battey should be done? What are the cases in which hysterectomy should be practised for fibroids? What part should age take in favoring or discouraging operation in cases of hemorrhage? Is hysterectomy ever advisable in cases of cancer of the portio vaginalis, or in cases of cancer of the cervix? What are the limits of the use of hysterectomy in cases of cancer of the body? In what cases of extrauterine fœtation is laparotomy to be resorted to, and when?

Major gynecology is too young to have laurels; its laudable zeal scarcely requires fostering. Minor gynecology requires pruning and direction, and even preliminary education, rather than fostering.

ON THE DILATATION AND HYPERTROPHY OF THE HEART,

WHICH ARE NOT PRODUCED BY CHANGES IN THE VALVES.

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That all the examples of cardiac hypertrophy and dilatation which we meet with in practice are not due to valvular lesions, is a proposition which every one will admit. That attention has been called to such non-valvular cases by a number of authors is evident to any one who reads medical literature. And yet the recognition of these cases, and their treatment, have not become matters of ordinary practice. It has seemed to me, therefore, that it might be well to group together the cases of cardiac dilatation and hypertrophy not due to valvular disease; to subdivide the group into its appropriate classes; and to state the characteristics of each class.

With the information now available the following seems to be the most convenient classification:

1. Hypertrophy and dilatation due to excessive and prolonged muscular exertion.
2. Hypertrophy and dilatation due to morbid changes in the lungs.
3. Hypertrophy and dilatation associated with the infectious diseases, with anæmia, and with pregnancy.
4. Hypertrophy of the left ventricle with lesions of the arteries.
5. Hypertrophy of the left ventricle with cardiac neurosis.
6. Dilatation of the ventricles with inflammation or degeneration of the walls of the heart.
7. Dilatation of the ventricles occurring without discoverable cause.

1. Hypertrophy and Dilatation due to Excessive and Prolonged Muscular Exertion.—Our knowledge of this form of cardiac

lesion has been largely obtained from observations on soldiers. Da Costa[1] has described this condition, as it existed in the soldiers during the late civil war, under the name of "irritable heart." The clinical history begins, he says, with a diarrhœa, or a continued fever, or prolonged marches. After the previous existence of these conditions the patients begin to have dyspnœa on exertion, palpitation, and pain over the heart. After a time the heart becomes hypertrophied, rarely only dilated. He believes that most cases are amenable to treatment, and that the hypertrophy may diminish.

W. C. McLean[2] says that a large number of cases of hypertrophy and dilatation without valvular lesions are produced in soldiers by long marches, and the pressure of their dress and accoutrements.

Fraentzel[3] gives 19 cases in soldiers: 10 of hypertrophy and dilatation of the left ventricle, 2 of hypertrophy and dilatation of the right ventricle, 3 of hypertrophy and dilatation of both ventricles, and 2 of dilatation of both ventricles. The clinical symptoms were those of feeble and irritable heart. All the patients went through the campaign of the Franco-German war, and developed the cardiac symptoms afterwards.

The same changes in the heart have been described by a number of authors as the result of overexertion in civil life, especially among the laboring classes. T. Clifford Albutt[4] says that the cardiac affections due to physical strain are obstinate irritability and dilatation of both ventricles with or without hypertrophy. Fothergill[5] mentions excessive labor with the arms and in constrained positions in workingmen as causes of dilatation and hypertrophy. In runners and gymnasts he has found dilatation and hypertrophy of the right ventricle. Quain[6] calls attention to the effect both of severe muscular exertions and of violent emotions in producing dilatation and hypertrophy of the heart. Peacock[7] says that the heart is liable to be overstrained from overwork, long-continued hard work, or sudden violent efforts. The cavities become dilated, and the valves incompetent.

J. Seitz[8] has written at considerable length on this subject, and cites twenty-five cases, thirteen of which were his own. Most of the patients were males and hard workers. All were well previous to the overwork; all were improved by rest, and the symptoms returned in all on the least exertion. In most of the cases a murmur, which was sometimes taken for a pericardial or endocardial murmur, was present. He thinks that this murmur is due to the rubbing together of the opposed surfaces of

[1] Memoirs of U. S. Sanitary Com., p. 372; The American Journal of the Medical Sciences, 1871.
[2] British Med. Journ., 1867, p. 161.
[3] Virch. Arch., lvii. p. 215.
[4] Med. Times and Gazette, 1873, p. 290; St. George's Hosp. Rep., 1870.
[5] Diseases of the Heart. London, 1880.
[6] Lumleian Lectures, Med. Times and Gazette, 1872, p. 352.
[7] Med. Times and Gazette, 1873.
[8] Deutsche Arch. f. klin. Med., xi. and xii.

the uninflamed pericardium, or to the enlargement of the opening of the mitral valve, and the consequent insufficiency of the valve.

The clinical picture was that of cardiac weakness, with symptoms referable both to the heart and to the accompanying disturbances of the circulation. In the larger number of the cases, although the symptoms might be alleviated for a time by rest, yet the course of the disease was from bad to worse.

It is a matter of ordinary observation that the repeated training employed in some athletic exercises leads in some individuals to hypertrophy of one or both ventricles. There seems then to be no doubt that prolonged and excessive muscular exertion may produce a well-marked change in the rhythm and size of the heart without lesions of the valves or changes in the structure of the heart wall. In some of the cases the rhythm alone is disturbed; the patients have an irritable heart without any marked change in its size. In other cases in addition to the irritability there are also dilatation and hypertrophy of one or both ventricles, and in some of these cases are added the symptoms due to venous congestion in different parts of the body. In still other cases, although the heart is enlarged, there is no change in its rhythm, and it does not trouble the patient.

2. Hypertrophy and Dilatation due to Morbid Changes in the Lungs.—Rokitansky[1] says that increase in the density of the lungs, destruction of the lung-tissue and its capillaries, and any obstruction to the emptying of the pulmonary veins may produce changes in the right heart. Deformities of the chest, pleuritic effusions, emphysema, interstitial pneumonia, and bronchiectasiæ are the ordinary causes of such changes in the lungs.

W. T. Gairdner[2] believes that nine-tenths of all cardiac hypertrophies, independent of valvular disease, are caused by diseases of the lungs.

Stokes[3] finds that dilatation of the heart is most frequently produced by diseases of the lungs and by atheromatous arteries, and is apt to occur in persons who have the gouty diathesis. He has seen no case of simple dilatation not associated with lung or liver disease.

Munzinger[4] gives an account of fifty autopsies of cardiac cases, in forty-two of which there was no valvular disease. He found that disturbances of the lesser circulation produced lesions of the right ventricle, and those of the aortic system lesions of the left ventricle. In workingmen, emphysema of the lungs and dilatation and hypertrophy of the right ventricle of the heart develop side by side. These persons have insufficient food, mostly composed of carbohydrates and liquor; they make great and continuous exertions; they lift and carry heavy weights, run up and down hill, etc. They develop cyanosis, œdema, dyspnœa, a curved back,

[1] Path. Anat., vol. ii. p. 259.
[2] Med.-Chir. Rev., July, 1853.
[3] Diseases of the Heart.
[4] Arch. f. klin. Med., 1877, p. 448.

round shoulders, and anæmia. The heart's impulse becomes diffuse and scarcely visible, and a mitral systolic murmur can be heard. It is the combination of bad food, overexertion, and alcohol which produces at the same time emphysema of the lungs, dilatation of the right and then of the left ventricle, and a feeble heart.

Baümler[1] gives several cases of dilatation and hypertrophy of both ventricles with old pleuritic adhesions and chronic bronchitis. Barlow[2] describes cases of dilatation of the right ventricle with pleuritic adhesions and phthisis.

Altogether the most frequent cause of such changes in the heart, however, is emphysema. The development of the dilatation and hypertrophy first of the right and then of the left ventricle seems to be dependent not on the degree of dilatation of the air spaces, but rather on the interstitial changes in the lung which belong to substantive emphysema. For this reason I imagine that some cases of heart disease due to emphysema are not properly classed, the dilatation of the air vesicles not being very marked. In the more marked examples of emphysema and ventricular dilatation the disturbances of the circulation, and consequent symptoms, are as bad as in the worst cases of valvular disease. The following case is a fair illustration of the course of the disease in many patients.

A male aged 48, had suffered from winter cough for twenty years; for five years dyspnœa on exertion became constantly more annoying; for the last three months the cough and dyspnœa have been much worse; for the past two weeks rapid loss of flesh and strength, dropsy of the legs, scanty urine, orthopnœa, and finally death, with extreme dyspnœa and cyanosis. At the autopsy the lungs presented the lesions of emphysema and bronchitis, the right ventricle of the heart was hypertrophied, the liver, spleen, stomach, intestines and kidneys were in the condition of chronic venous congestion.

3. Hypertrophy and Dilatation associated with the Infectious Diseases, with Anæmia, and with Pregnancy.—The changes in the ventricles in infectious diseases have been noticed by many observers. M. A. Fabre[3] says that in typhoid fever there is a myocarditis affecting the papillary muscles, followed by incompetency of the mitral valves and dilatation of the left ventricle.

Friedreich[4] mentions a form of dilatation aside from valvular disease or fatty degeneration, which results as a lack of tonus in the heart muscle in the course of puerperal fever, pyæmia, typhoid and typhus fevers. While it is not doubted that an acute parenchymatous change may take place, still, under the above conditions, atonic relaxation and dilatation may simply result.

[1] Arch. f. klin Med., xix. p. 471.
[2] Guy's Hosp. Rep., 1859, p. 349.
[3] Gaz. des Hôpit., 1877, p. 1083.
[4] Krankh. d. Herz.

Von Dusch[1] says that dilatation has its etiology in the heightened cardiac pressure on the ventricular wall during systole and a diminished elasticity of the walls. The relaxation has its origin in granular degeneration in the infectious diseases.

Goodhart[2] and Barlow[3] describe cases of acute dilatation of the left ventricle as causes of death with scarlatina and dropsy.

Friedländer[4] believes that in nephritis with scarlatina it is the rule to have hypertrophy of the heart combined with dilatation. The hypertrophy results not only from the effects of the scarlatinal poison, but also from the nephritis; it is due to obstructed capillary circulation, diminished secretion of watery elements, and retention of excrementitious matters. When the heart muscle through the scarlatinal poison, the anæmia, or the vomiting, becomes functionally injured, then acute dilatation results. After the urine has become diminished the heart's impulse is spread over a greater area, and the dilatation is ushered in by a murmur both when hypertrophy or dilatation is produced.

It seems evident that dilatation of the heart in typhus and typhoid fevers belongs to some epidemics and not to others, and that it depends principally on the changes in the ventricular wall. In scarlatina, on the contrary, it seems probable that the changes in the heart are principally due to the obstructed circulation in the bloodvessels.

Anæmia is generally recognized to be a cause of enlargement of the heart, both in the temporary anæmia of young women, and the persistent anæmia of pernicious anæmia, leukæmia, etc. It is usually ascribed to the feebleness of the muscles of the heart wall.

Pregnancy is said to be accompanied by hypertrophy of the heart by some authors,[5] but this is denied by others.

4. Hypertrophy of the Left Ventricle with Lesions of the Arteries.—Hypertrophy of the left ventricle is frequently seen with endarteritis of the aortic system, involving either the aorta alone, or the larger arteries also. The general thickening of the walls of the smaller arteries, which is so frequently associated with the atrophic form of chronic Bright's disease is regularly attended with hypertrophy of the left ventricle. When this same condition of hypertrophy of the left ventricle is developed with chronic nephritis without actual disease of the arteries, it seems probable that the unnatural contraction of the smaller arteries may have the same mechanical result.

A congenital narrowing of the aortic system with well-marked dilatation and hypertrophy of the left ventricle, has been described by a number of authors.

[1] Lehrb. d. Herzkrankh.
[2] Guy's Hosp. Reports, xxiv. p. 153.
[3] Med. Times and Gazette, 1880.
[4] Canst. and Virch. Jahrb., 1878.
[5] Lardner, Arch. Gén., 1859. McDonald, Heart Disease during Pregnancy. Cohnstein, Virch. Arch., 77, p. 146.

5. Hypertrophy of the Left Ventricle with Cardiac Neurosis.—The most frequent examples of this condition are furnished by exophthalmic goitre. In this disease the increased rapidity of the heart's action is regularly followed by hypertrophy of the left ventricle.

A certain number of cases of palpitation of the heart, associated with a variety of causes, are followed after a time by enlargement of the heart. This enlargement is sometimes attended with increased force of the heart's action; in other cases, on the contrary, the rhythm of the heart is irregular and feeble.

6. Dilatation of the Ventricles with Inflammation or Degeneration of the Walls of the Heart.—This form of dilatation seems to be due either to pericarditis, to interstitial myocarditis, or to fatty degeneration.

With severe pericarditis and the formation of extensive adhesions, either one or both of the ventricles may become dilated and hypertrophied. With interstitial myocarditis the dilatation is sometimes general, sometimes circumscribed and aneurismal. With fatty degeneration the heart, although often small, is sometimes enlarged, the ventricles are dilated and their walls thinned.

7. Dilatation of the Ventricles Occurring Without Discoverable Cause.—This seems to me the most interesting of this entire group of cardiac cases. The cases are not at all uncommon; they are met with in ordinary practice, and their nature and causation are very obscure. I include in this set of cases some of those which are said to result from sudden emotions and sudden exertions, and some of those said to have been fatty. None of these can be considered satisfactory causes; and in other similar cases no such conditions existed.

On account of the clinical importance of this group of cases and the moderate number which have been recorded, I shall give a number of examples in detail.

Case I., R. Thompson.[1]—A laborer, aged twenty-three, six days before admission, after work, suddenly experieneed pain below the liver; tormina, collapse, orthopnœa, vomiting, small rapid pulse, no cardiac murmur. At the autopsy the heart was found to weigh eighteen ounces; both ventricles were dilated; the valves were not diseased; the muscular tissue of the walls of the ventricles was pale and fatty.

Case II.—A male, aged twenty-eight, on lifting a heavy weight became suddenly ill; pain over the heart; hæmoptysis; vomiting; systolic murmur at the base; pulse 108; apex beat in the sixth interspace. At the autopsy both ventricles were found to be very much dilated; their walls thin; no lesion of the valves; venous congestion of the liver, spleen, and kidneys.

Case III., McDowell.[2]—A female, aged twenty-three, suffered for fifteen months from cardiac palpitation, hæmoptysis, dyspnœa, bron-

[1] St. George's Hospital Reports, 1870, p. 119.

[2] Dublin Med. Journ., 1852, p. 352.

chitis; heart irregular and dilated; systolic murmur; general dropsy. At the autopsy the left ventricle was very much dilated; the valves healthy; the heart muscle of pale brown color.

CASE IV.—A female, aged sixty-three, suffered with cyanosis, dyspnœa, systolic apex murmur, irregular heart action. At the autopsy there was found dilatation of both ventricles, without valvular disease.

CASE V.—Moxon[1] relates a case of acute dilatation of the heart, which followed excitement during sexual intercourse. There was found after death dilatation of the left ventricle without ventricular lesions.

CASE VI.—Latham[2] gives a case of a man who ran violently against another person, and subsequently developed palpitation, anasarca, and died with enormous dilatation and hypertrophy of the heart, without valvular disease.

CASE VII.—He also cites the case of a man, who in a paroxysm of rage was forcibly restrained, and subsequently developed cardiac dilatation and dropsy, without valvular lesions.

CASE VIII., Delafield.—A male, aged twenty-six, a farm laborer, was perfectly well until thirteen months before his death. Then, without known cause, he had an attack of oppression in the epigastrium, followed by loss of consciousness and clonic spasms. After half an hour vomiting commenced and lasted several days. Since then he has had four similar attacks at intervals of from two weeks to six months. No cough, dyspnœa, palpitation, or dropsy; but has not been strong enough to work since his first attack. During the last month of his life he had four attacks, each characterized by temporary unconsciousness, persistent vomiting, and pain in the epigastrium; very irregular heart action, the pulse varying from 27 to 190; the heart gave the physical signs of dilatation without murmur. At the autopsy both ventricles of the heart were found very much dilated, without valvular disease. All the viscera were in the condition of venous congestion.

CASE IX., Delafield.—A male, aged twenty-six, a gardener, was perfectly well until three weeks before his death. Then, while lifting a wheelbarrow, he was suddenly seized with dyspnœa. The dyspnœa continued, and was very severe and constant up to the time of his death. The heart was much dilated, its rhythm was very irregular, there was no murmur. After death both ventricles were found to be very much dilated, no change in the muscle of the heart walls, nor in the valves. There was venous congestion of the viscera and dropsy of the venous cavities.

CASE X., Delafield.—A male, aged thirty, a shoemaker, had been troubled for a year with cough and occasional vomiting. Four months before his death dropsy began, and continued. The heart's action was feeble and irregular, there was no murmur. Both ventricles were found dilated, without valvular lesions, or changes in the muscular tissue.

CASE XI., Delafield.—A male, aged twenty-seven, a driver; says that twelve weeks before his death he caught cold and began to have a cough, dyspnœa on exertion, and pain in the epigastrium. Seven weeks before his death he presented the physical signs of dilatation of the heart, without a murmur. He continued to have dyspnœa, developed general anasarca, and died. There was dilatation of both ventricles without valvular disease, and chronic venous congestion of most of the viscera.

[1] Med. Times and Gaz., 1871.

[2] Diseases of the Heart, 1876, p. 351.

CASE XII., Delafield.—A male, aged forty-two; about five months before his death began to have dyspnœa, palpitation, cough, and mucous expectoration. The dyspnœa continued, dropsy developed, and he died. Both ventricles were much dilated, the heart muscle was not degenerated, the valves were healthy. There was venous congestion of most of the viscera.

CASE XIII., Delafield.—A male, aged forty, said that he had been strong and well until four weeks before his death. Then he suddenly developed extreme dyspnœa so that he had to stop work. The heart's action was rapid and feeble, but there was no murmur. The dyspnœa continued to be most severe up to the time of his death. Both ventricles were dilated, their endocardium was a little thickened, there was a growth of connective tissue between the muscular fibres, with degeneration of the fibres. The aorta presented the lesions of chronic endarteritis. The viscera were congested.

CASE XIV., Delafield.—A male, aged fifty-three; eleven months before his death began to have dropsy of the legs. He lost appetite, flesh, and strength, and the dropsy increased. Then he developed dyspnœa, palpitation, precardial pain, cough with bloody sputa, and vomiting of blood. The heart's action was rapid and feeble, it was dilated, there was a mitral systolic murmur. Both ventricles were much dilated, without hypertrophy, there was a little old thickening of the aortic and mitral valves. The kidneys were examples of the atrophic form of chronic Bright's disease. The lungs were emphysematous.

It is doubtful whether or not this case belongs with this group.

CASE XV., Delafield.—A male, aged forty, suffered for seven weeks from general prostration, cough, great dyspnœa, and constant hæmoptysis. Both ventricles were much dilated, the valves were normal, there was a moderate growth of connective tissue between the muscular fibres of the heart wall. The viscera were congested.

CASE XVI., Delafield.—A male, aged sixty, a grocer; about eight months before his death suddenly developed dyspnœa and dropsy of the legs; these symptoms continued for three months, then he improved until three weeks before death. The dyspnœa became urgent, there was cyanosis, the heart was dilated, its action was feeble and irregular, there was no murmur.

After death both ventricles were found much dilated, there was a little old thickening of the aortic and mitral valves; the viscera were congested.

The cases which I have narrated are evidently not all of exactly the same character, but yet they constitute a convenient clinical group. In most of them no cause at all for the cardiac lesion could be discovered; and in those cases in which there was a history of sudden exertion, or mental emotion, or of change in the wall of the heart, these conditions do not seem at all adequate to explain the cardiac lesion.

Most of the cases were males, and many of them young adults. The invasion of the symptoms was sudden in seven cases, gradual in five, and in three was not stated. The disease ran in some cases an acute, in others a chronic course. In my own cases the shortest period was twenty-four days, the longest fifteen months. The heart's action was

irregular and feeble, the physical signs of dilatation were evident, in some of the cases there was a systolic murmur, in others none. The dyspnœa was in most of the cases a marked symptom. I have never seen more distressing dyspnœa than that which existed in some of my cases. Dropsy was developed in the more protracted cases, but not in those of shorter duration. The urine in the cases which I have seen was diminished in quantity, the specific gravity from 1.010 to 1.026, there was no albumen present, or but very little. The dilatation regularly involved both ventricles, and hypertrophy was the exception.

The lungs, liver, stomach, spleen, and kidneys regularly presented the condition of chronic congestion which belongs to marked valvular lesions of the heart.

The course of the disease was from bad to worse, and even the symptoms were but little alleviated by treatment.

SOME OBSERVATIONS ON THE THEORY OF BRONCHIAL ASTHMA,

VIEWED IN THE LIGHT OF THE PATHOLOGY OF HAY FEVER.

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No one who has studied carefully that most admirable treatise of Dr. Blackley on hay fever can justly doubt the general accuracy of his conclusions concerning its causation; and no one can fail to admire both the careful manner in which he has conducted his clinical inquiries and experiments, and the judicial caution which he has exercised in dealing with the results of them. Nevertheless, whilst he has proved conclusively that, *within the range of his experience*, the majority of cases of hay fever are produced by the action upon the nasal mucous membrane of the pollen of certain cereals and grasses, he has not, with adequate clearness and strength, set forth the facts that hay fever may arise from different causes, and at seasons other than the season in which pollen is produced and diffused throughout the air. Further, it is a curious fact that among all the recorded subjects of this disease it is found to be least common among those who are most exposed to the action of pollen. Gardeners, farmers, and agricultural laborers seldom suffer; whilst young men and women of culture in the higher ranks of society are its most common victims. To bring to light the true cause of this malady, to unravel its relations to maladies resembling it, and to get hold of the

right principles of treatment, it will be necessary to consider those cases of the disease arising in circumstances which practically exclude the possible action of pollen upon the mucous membrane.

Hay fever occurs in winter or spring; sometimes it occurs at sea or in the heart of a great city; sometimes, when no pollen can be found in the air, it arises after a full meal, or in the middle of the night; sometimes it appears almost instantaneously under the influence of intense light, the heat of a great fire, the odors emanating from certain localities, plants, and animals; some particular place or position occupied in driving; or from emotions and vivid ideas. In these and in all like cases there are clearly two main factors at work, a certain local or constitutional predisposition, and some immediately acting exciting cause. That some such predisposition exists is plainly proved from the fact that the exciting agents which produce the malady in one class of persons entirely fail to produce it in another; and that these exciting agents, in their relations to the persons acted upon by them, are in a remarkable manner specialized seems also proved by the circumstances that the emanations from a stable which in one person provoke a severe attack, produce in another, liable to hay fever, no sensible effect. And of the persons subject to this disease, it must be said that they are not always affected in the same manner by the same agent; for sudden intense light which may bring on an attack at one time will quite fail at another; and so we are compelled to conclude that the organism, or some particular part of it, varies so much in its conditions that its relations to its environments are capable, without sensible structural alteration, of becoming completely changed.

When we inquire into the family and personal history of an individual subject to hay fever, we shall discover as the prominent point in it that the patient and his people are more or less "neurotic." There may be found among members of the patient's family the disease of which he is himself the subject, gout, such skin troubles as urticaria and eczema, migraine, neuralgia, epilepsy, and no inconsiderable sprinkling of pulmonary disease. But that which will be found the most widely, and will connect them all, will be a sensitive, an irritable, and an unstable nervous system.

When we pass from the family to the individual, and examine in him the character of his general health and the assemblage and progression of phenomena which together constitute an attack of hay fever, we shall be compelled to admit that the prime agent therein, the agent which underlies, originates, develops, and regulates the phenomena is a nervous agent. And although this nervous agent, or, more correctly, this nervous state, is not always and everywhere manifest throughout the nervous system, it is always manifest, or capable of manifestation, within the area of the parts affected.

Some patients allege that they are made aware of the approach of an attack of hay fever by experiencing for a day or two feelings of great elation, or of great depression. Probably this means nothing more than that the nervous system has been brought by indifferent causes into an unstable condition, in which its liability to become affected by the exciting agents of the malady is greatly increased. At any rate, constitutional prodromata are neither usual nor necessary, since for the most part the attack follows almost instantaneously the application of its common causes.

The order in which the symptoms of hay fever appear, the character, subjective and objective, which they assume, the course which they follow, the time which they last, and the manner in which they end, vary in different persons, and in the same persons at different times. But the usual way in which the phenomena arise, advance, decline, and terminate may be thus described. First of all, over the forehead, in the eyes, about the ears, in the hard palate, or throughout the upper part of the nose, both inside and out—in one or in several of these places together—there is experienced a sensation of fulness or tightness. This is succeeded by sensations of itching, formication, tingling, pricking, and more or less numbness or soreness. Then the mucous membrane of the special sensory part of the nose begins to swell, becomes coated with a viscid, irritating mucus, and finally closes the nasal passages to the entrance of air. Meanwhile the eyelids become puffed; and the ocular and palpebral conjunctiva, as well as the mucous membrane of the pharynx, exhibit swellings resembling, except in their smaller size, urticarial wheals. The whole region implicated in the affection feels stuffed and tight, or drawn and numb. Now, or earlier, irregular and sometimes violent sneezing sets in; a feeling of oppression is experienced in the throat and chest, and at last relief is obtained through a profuse secretion of more or less limpid serum, or of watery mucus, from the nose. When there is also a flow of tears the sense of relief is augmented; but the augmentation is a doubtful good, since the tears, altered in character, irritate and sometimes erode the surfaces over which they travel.

With a continuing secretion the swelling of the nasal mucous membrane subsides, air enters freely through the nasal passages, the oppression of chest disappears, the attacks of sneezing become less frequent and violent, and the patient expresses himself lightened and relieved.

After removal of the viscid mucus, which appears at the earlier stage of the attack, the flow from the nasal mucous membrane consists of a limpid serum, or of a watery mucus; and in both instances the fluid contains, in addition to epithelial cells, blood-disks, and hyaline globules, crowds of lymph-cells in the active changes of advancing and regressive growth. Microörganisms of various kinds are also present in great

abundance; but I have discovered no reason to suspect that they hold any causal relation to the disease. At a later period the discharge becomes mucopurulent, and more or less mixed with blood; and the nasal mucous membrane may be seen upon examination to be studded with bloody points, minute ash-colored patches, and small superficial erosions.

Attacks of hay fever arising independently of pollen may be continuous, and become in a sense chronic; they may remit or intermit, or they may come and go quite irregularly, and without apparent cause. In exceptional cases they appear, with some regularity, just before the advent of menstruation.

Although in the course of an attack of hay fever the patient is sometimes distressed by painful sensations, it is seldom that there is any grave constitutional disturbance. Occasionally, however, an event does happen which not only produces alarming symptoms, but which, critically examined, leads to a clearer and juster apprehension than we generally possess of the pathology of bronchial asthma.

In a patient suffering from hay fever, it happens now and then that all the nasal symptoms cease, and that in place of them there arise, sometimes suddenly, sometimes slowly, all the signs and all the symptoms of an attack of ordinary bronchial asthma. More rarely the affections alternate, and there is established a more or less regular see-saw between the nasal and the bronchial troubles. And the more closely and critically one examines them, the stronger grows the conviction that they possess the same hereditary, constitutional, and local alliances, that the same structural changes exist in both; that the same causes operate in their production; that they follow the same courses; that eventually they have the like issues; and that the differences to be found in their effects are to be explained by the difference of the parts affected and the widely different importance of their respective functions in the economy. If all this be true, if it be true that hay fever is a neurotrophic vascular disease, if it be true that all the essential facts of this malady find an adequate and a complete explanation in the hypothesis of a nervous origin of the affection, and if it be also true that we should admit no more cause of a thing than those that are both true and sufficient, why should we not consider bronchial asthma to be the same disease as hay fever, and why should we invent unnecessary and unphysiological explanations of phenomena otherwise to be accounted for by demonstrable facts?

It is alleged that the asthmas—the asthma connected with hay fever and the asthma which is not—are two very different affections. But the grounds for the allegation are untenable, and have been taken on the assumption that the action of pollen upon the nasal mucous membrane is the exclusive cause of hay fever. But I contend that other external agents are capable of producing this malady, and that some-

times it is provoked by disorders engendered within the system itself. If such be the case, there is neither force nor meaning in the saying that the one arises in the night and the other in the day; that the one occurs in the house, the other in the air; that the one is due to the inhalation of pollen and the other not; that in ordinary asthma the attacks appear at any time, and alternate with long intervals of perfect health, and that in hay fever the attacks occur only in summer, and last as long as the pollen remains diffused in the atmosphere. But we may justly go much further than we have gone in advocating the unity of the two affections. We may contend that whilst neurovascular swellings, like those of hay fever, more or less suddenly coming and going in the mucous membrane of the air tubes would afford a true and adequate explanation of the phenomena of ordinary bronchial asthma, the main theory now in vogue respecting it is neither the one nor the other.

This theory is that asthma is a primitive substantive disorder, not necessarily connected with organic disease, and that it is due to spasmodic contraction of the bronchial muscles and its effects.

Upon the other theories of asthma, that it is a mere neuralgia of the vagus, that it consists of a group of symptoms due to various kinds of structural alterations, that it depends upon temporary paralysis of the expiratory muscles, and that it is essentially a tetanic contraction of the great muscles of inspiration, I shall not now dwell.

In favor of this "spasm theory" of asthma, which we owe to Williams, Gairdner, and Bergson, it is contended that it is adequate to the explanation of the facts of the disease; that it conforms to our present physiological and pathological knowledge; that it is the only possible explanation of the paroxysm; and that it is beyond both the possibility of cavil and the necessity of proof. These are brave words; and if it were, as it is not, that mere logic is the final measure and test of truth, much might be said in support of their bravery. We examine a man in a paroxysm of asthma; he is suffering from urgent dyspnœa. Leaning forwards upon his arms which are in a fixed position, he makes every conceivable effort to inspire, and every muscle of inspiration, ordinary and extraordinary, seconds his efforts. Upon his inspiration, which is labored, slow, and loud, he spends his available strength, whilst to his expiration, urgently needed to reduce his overdistended chest, he gives nothing. The chest is not only distended but tympanitic; the heart beats tumultuously, the pulse is small, feeble, frequent; a cold sweat bedews the skin; the countenance expresses anxiety and suffering. What is the cause of this dyspnœa? There is neither disease of the heart nor congestion of the lungs. It is not due to inflammation or to tubercle, for there is not a sign of either. It is not due to mere accumulation of mucus; for from the beginning to the end of the attack there may not be a spoonful discharged. It is not due to emphysema,

for the dyspnœa of that would be more or less continuous. It is a dyspnœa which is quite peculiar. Breathing is long-drawn, labored, slow, noisy, dry, coughless, and characterized by extreme difficulty of expiration, the convulsive efforts to inspire suggest the presence of some obstruction to the entrance of air. The absence in varying regions of the chest of the respiratory murmur shows that such obstruction exists, and that it is both temporary and shifting. Where is the obstruction? Not in the lungs, which are expanded to the utmost, and everywhere resonant on percussion. There is no tumor pressing upon the trachea or bronchi; no paralysis of the vocal cords. Certainly, then, the obstruction must be in the bronchial tubes. Listening to the chest, we soon learn that the cause of the obstruction is a stricture; for the almost noiseless passage of the air through the tubes is converted at a certain point into a noisy sibilant wheeze. What is the cause of this stricture? It is not mucus, for no expiratory force can dislodge it. It is not an inflammatory thickening, for it shifts and varies. Nothing remains to account for the phenomenon but constriction of the bronchial tube, produced by spasmodic constriction of the bronchial muscles. As you continue to listen the spasm relaxes, the sibilant râle ceases, the respiratory murmur returns. In another place, where the breath sounds are sufficiently normal, the whistling noise is suddenly heard, and in the lung beyond the respiratory murmur disappears. At various parts, in close succession, the same phenomena come and go. The demonstration is complete. The cause of the asthmatic paroxysm is shifting spasm of the bronchial tubes. If you wish, says Bergson, any further proof of the truth of this doctrine, give to the asthmatic, in the height of his paroxysm, a dose of chloral or a hypodermic injection of morphia and atropine, and he will be made free from suffering. Nothing but a bronchial spasm would so respond to such remedies.

Such is the rough presentation of the form of the argument employed in supporting the bronchial spasm theory of asthma.

Let us now examine the main points of this argument.

1. We have received from Williams and Bert conclusive proof that, under various stimuli, the bronchial muscles are capable of a slow and limited contraction, but we have no proof whatever that this contraction is of a kind, completeness, or quickness sufficient to account satisfactorily for all the local phenomena of the asthmatic paroxysm. Indeed, Paul Bert, to whom we owe the most conclusive proofs of the contractibility of the bronchial muscles, considers it to be quite inadequate to account for the dyspnœa now in question.

2. It has been proved by experiment that, when the chest is forcibly expanded, the bronchi contract only very slightly, or not at all. In the asthmatic paroxysm the thorax is strongly dilated, and it is in the highest degree doubtful whether in the face of the dilating force of violent

inspiratory efforts, there would occur any considerable contraction of the bronchial tubes.

3. The alleged spasms are most common where the circular muscles are least abundant. The walls of the terminal bronchi and of the earlier interalveolar passages are composed in great part of circularly arranged muscles, and are more compressible, as well as more dilatable, than the larger air tubes. Now, if spasm of the bronchial muscles be the essence of the asthmatic paroxysm, why does this spasm stop short at a particular part where the muscles are most abundant and most irritable? Why are the smaller tubes not contracted and closed? And, if they are contracted and closed, why is the chest dilated, instead of collapsed? Why are the lungs full of air? And why is there clearness of percussion, instead of dulness?

4. There is no proof forthcoming that the sounds heard in the chest during the asthmatic paroxysm are really due to constrictive spasms of the bronchial tubes. It may be conceded that those sounds suggest the idea of spasm, and that the patient's feelings testify to its existence; but, in a scientific inquiry, evidence of this sort, based upon impressions, and, to some extent, opposed to physical laws, may demand fresh search, but can have no permanent place or value.

5. In the asthmatic paroxysm the variation in pitch, and the sudden shiftings in place of the stridulous noises heard in the chest, accompanied by more or less complete hindrance to the entrance of air, seem to be incompatible with any just notion of the contractibility of the bronchial muscles, which is slow, persistent, and progressive.

From these and from other reasons not now set forth, I conclude that the bronchial spasm theory of asthma is either inadequate to explain the phenomena of the paroxysm, or is not in harmony with the present state of physiological and pathological knowledge.

If now we return to our study of the local phenomena of hay fever, we may find in them the grounds of an adequate expression of the phenomena of the asthmatic paroxysm and of a true theory of its nature. Let us remember that the various disorders of sensation which begin the paroxysm of hay asthma are followed by general or local swellings of the nasal mucous membrane; that these swellings rise and subside with great rapidity; that they are capable of completely occluding the nasal passages; that the air traversing them, when partially open, produces shifting stridulous sounds; that, when secretion occurs, it is either watery, acrid, and abundant, or scanty and mucoid or gelatinous; and that, toward the close of the paroxysms, the discharge becomes sometimes purulent and stained with blood. Let us remember, furthermore, that the end of an attack of hay fever is occasionally the beginning of an attack of bronchial asthma; that now and then the two affections alter-

nate; and that, although rarely, asthma, hay fever, and urticarial rashes are exchangeable troubles in the history of the patient and his family.

If now, making due allowance for anatomical differences, we suppose that the structural changes occurring in the nasal mucous membrane during an attack of hay fever were to occur also in various parts of the bronchial mucous membrane, would their presence there, going and coming, afford a complete and adequate explanation of the facts observed during a paroxysm of bronchial asthma? I am fully impressed by the conviction that they would; and that, furthermore, by the presence of those bronchial swellings and their immediate effects, we should become able to solve difficulties which, under the reign of the spasm theory, are regarded as insoluble.

It would certainly be interesting, and might be instructive, to set forth the grounds of this conviction through a critical examination of every separate sign and symptom of the asthmatic paroxysm. But I fear that neither the practical importance of the subject, nor the time at the disposal of my readers, would justify such a course. Happily, however, this end may be otherwise achieved, and at the cost of but a small sacrifice of material evidence. In the following series of propositions I shall endeavor to set forth as concisely as possible what I regard as the teaching of a study of hay fever concerning the pathology of bronchial asthma:

1. Asthma is a neurovascular trophic disease, and has its roots in a special vulnerability of the respiratory mucous membrane, of the respiratory nerve centres, and of certain portions of the sympathetic.

2. The irritation exciting the nerve discharges which bring about the asthmatic paroxysm may arise in the blood, in any one of the mucous tracts, but more particularly the respiratory one, in certain cutaneous inflammations, and in the central nervous system itself.

3. The paroxysm begins by a more or less diffused hyperæmic swelling of the bronchial mucous membrane, and is continued by the development at various parts thereon of circumscribed congestive swellings, which come and go with greater or less rapidity, and resemble, in many particulars, the swellings of the skin in nettlerash.

4. At their first appearance these swellings become coated with a viscid mucus, hinder the entrance and exit of air, and by their vibration produce for the most part the drier râles characteristic of a certain state of the asthmatic paroxysm. Toward the close of an attack, the swellings after free secretion subside, the dyspnœa is relieved, and moist take the place of dry râles.

5. The secretion from the swellings being sometimes acrid, and even corrosive, may excite some contraction of the bronchial muscles; but such contraction cannot become, either by its nature or its amount, the chief factor in the evolution of the asthmatic paroxysm.

6. The hyperæmia and circumscribed swellings of the bronchial mucous membrane hindering the free entrance of air, and thereby the full aëration of the blood, both the peripheral nerves and the respiratory centres are irritated, and exaggerated discharges of respiratory impulses are sent to the inspiratory muscles, which are thrown thereby into violent and sometimes even tetanic contractions.

7. These violent inspiratory efforts increasing the Hallerian extension force of the thoracic walls, straighten the bronchial tubes, and, notwithstanding the tendency of inspiratory forces to increase the size of the swellings, make the entrance of air into the lungs far easier than its exit.

8. When the inspiratory efforts cease, and the expiratory recoil begins and is continued by the muscles of forced expiration, the smaller bronchi, more especially those containing mucous wheals, are compressed, and all the passages are relaxed and lose their straight direction. Thus the egress of air is greatly hindered, and the act of expiration so much prolonged that it is sometimes suddenly interrupted and prematurely closed by the violent inspiratory efforts originated in the respiratory nerve centres through the circulation of imperfect oxidated and decarbonized blood. In this way inspiration gains upon the expiration; the alveoli are extended with air; the diaphragm is depressed; the chest, in all its dimensions, is dilated; breathing becomes more and more difficult; death seems imminent; and the paroxysm is at its height.

9. After a time, varying greatly in duration, the attack begins to subside, and, partly by secretion from the bronchial mucosa, partly from the exhaustion of the excitability of the respiratory and vasomotor centres, respiration becomes easy, lividity and swelling of the face disappear, restless anxiety is displaced by growing calm, and the attack is brought to an end.

The views here set forth resemble, in some particulars, the view published by Weber in 1872. They are, nevertheless, the views which I have taught at the London Hospital for the last twenty years, and which were embodied in the opening address of the discussion upon asthma at the Cambridge meeting of the British Medical Association.

It cannot justly be held that the truth or error of a theory is to be determined solely by its fertility or its barrenness; but for us, who are practitioners of medicine, in its capacity for being turned into a working hypothesis, and the extent to which it may be made applicable to practical work, are not only a main ground of its acceptance, but some measure of its worth. Whether the theory of hay fever and of bronchial asthma herein advanced will bear the successful application of this criterion of its value, cannot now be determined. But the question is ripe for discussion, and on another occasion we may submit it to critical examination.

KOLPOHYSTERECTOMY FOR CANCER,

WITH TABLES COMPARING ITS METHODS AND RESULTS.

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The recent announcement of but an 8 per cent. mortality in 24 consecutive cases by Fritsch,[1] of but a 9 per cent. mortality in 55 consecutive cases by Martin,[2] and of 16 cases by Staude,[3] without one death, has revived a somewhat abated interest in this operation. Sänger's[4] mortality of 28 per cent. obtained in 1883, had to the end of 1884 remained unaltered, notwithstanding the increased numbers of Mundé's,[5] Doche's,[6] and Duncan's[7] lists. The limits of success had been apparently reached, and the operation, even by its friends, abandoned to the opprobrium of an extraordinary death-rate. This opprobrium has been in a degree lifted. A brief history of the operation, the fact of a recently diminished mortality, with an analysis of its concomitants, and among them possibly its cause, will form the objects of this paper.

There is an imperative demand for improved methods of treating cancer. Its increased ravages are reported from a number of sides. In England and Wales from 1860–69 the deaths from cancer showed an annual increase of 248, while from 1870–79 they showed an annual increase of 320. Dr. Farr finds the English death-rate from cancer, 1873–74, 443 to each 1,000,000 inhabitants (*N. Y. Med. Record*, March 14, 1885, from figures of Register-General's Report). In New York, ten years ago, the deaths from cancer were but 400 to the 1,000,000 inhabitants, while, according to the latest returns, they are now 530 to the 1,000,000. Dr. A. R. Carter, of Baltimore, finds a great recent increase in the mortality from cancer in that city. While the population of Baltimore is but five times as great as it was thirty years ago, the deaths from cancer are now at the rate of 450 to the 1,000,000 inhabitants, or twenty-six times as frequent as at that period (*N. Y. Med. Record*, April 25, 1885).

Cancer is comparatively more frequent among women than among men. Simpson, of England, says that cancer is three times as frequent among women as among men.

[1] Bokelmann, Arch. f. Gyn., 1884, p. 75. Heilbrun, Centralblatt f. Gyn., Jan. 31, 1885.
[2] Düvelius, Deutsche med. Wochenschr., Feb. 26, 1885.
[3] Schutz, Centralblatt f. Gyn., Feb. 7, 1885.
[4] Sänger, Arch. f. Gyn., 1883, xxi. 99.
[5] Mundé, Tr. Am. Gyn. Assoc., 1884.
[6] Doche, quoted by Gaz. Méd. de Paris, Feb. 14, 1885.
[7] Duncan, London Lancet, Jan. 31, 1885.

It is rare that reliable statistics regarding the relative frequency of the different varieties of cancer can be obtained, as the variety is seldom designated by physicians in their returns. Especially valuable, therefore, are the figures presented by the K.K. Krankenanstalt Rudolph Stiftings in Vienna, where, in 1882, there were treated 4451 men and 3159 women. Among this number there were 120 cases of malignant disease, of which 111 were cancers. Of the 120 cases, 25 were men and 95 were women, while of the cases among women, 57 were cancers of the uterus. In 1883 there were treated, in the same place, 5472 men and 3482 women, 115 being cases of malignant disease, and 104 cancers. Of the 115 cases, 27 were among men and 88 among women, 62 being cancers of the womb.

Hofmeier[1] reports that of 16,800 gynecological patients treated in Schröder's clinic, 603 suffered from cancer of the uterus, while of 9400, in Schröder's private practice, 209 had cancer of the uterus.

In rough numbers, therefore, it may be stated that the death-rate from cancer has increased during the last ten years; that three-fourths of all cancers are among women; that one-half of all cancers are cancers of the uterus; and that cancer of the uterus comprises, in Berlin, from one-fourth to one-third of all gynecological complaints.

This increased mortality, with the comparatively greater frequency of the disease among women, and its predilection for the uterine tissues, make extirpation of the uterus for cancer a subject of superior importance at the present time. While, however, some regard the recent successes of this operation as an enthusiastic promise for the future, others distrust their omen, remembering the history of the past.

Early Efforts at Extirpation of the Uterus for Cancer.—Andreas a Cruce,[2] in 1560, is supposed to have first performed this operation. He left a manuscript description, copies of which are to be found in the Berlin and Göttingen University libraries.

No further literature appears until the early part of the present century, when, in 1810, Joseph's Academy of Vienna offered a prize for an essay upon the subject. This movement was probably incited by the results of partial extirpation in the hands of Osiander, of Germany, and of Lisfranc, of France. The prize was awarded in 1814 to Gutberlet, who gave a complete set of rules for the operation, the abdominal section being made.

In 1825 Langenbeck the father operated according to Gutberlet's directions. The operation was repeated by Conrad Martin, of Germany, by Blundell, of England, and twice by Delpech, of France, who

[1] Zeitschr. f. Geb. u. Gyn., 1884.

[2] Kocks, Arch. f. Gyn., 1879, S. 127. Mikulicz, Berl. klin. Wochenschr., 1880, S. 1282. Kaltenbach, Op. Gyn., 1880, S. 409.

presented the subject before the French Academy. For Langenbeck's operation an assistant stood upon the right side of the patient to hold back the intestines from the excavation, and at the same time to compress the iliacs with the forefinger and thumb. A second assistant held in position a uterine sound, which was useful as a guide to the operator, and to render the neighboring tissues tense. A curved bistoury was carried upon the operator's forefinger so as to shield its cutting edge, and the parametria were divided as they were successively made tense. After all had been severed the uterus was lifted out, and a tampon soaked in a styptic solution was placed in the vagina, and the abdominal wound was closed. No other sutures, ligatures, or drainage were employed.

Delpech first loosened the vagina and separated the bladder from the cervix, the patient being in the position for stone. He afterward opened the abdomen in the linea alba, divided the remaining attachments of the uterus, and removed it. Both of Delpech's cases recovered, a vesico-vaginal fistula being left in the second case. Langenbeck's case died.

In 1822 Sauter removed a cancerous uterus by the vagina; the patient recovered.

Langenbeck's name is also associated with the early history of the vaginal method. By some it is claimed that he originated it, as in 1813 he did a supravaginal amputation for cancer; and upon autopsy, thirty-one years later, the upper segment of the uterus was found to have been completely removed. Langenbeck did a total extirpation, according to Sauter, in 1825, Blundell in 1828, and Récamier in 1829. Langenbeck did this operation without medical assistance. Having a hemorrhage during its progress he was obliged to secure the bleeding vessel with one hand, while with the other hand, and with his lips, he adjusted the ligature. Langenbeck's case died. Récamier's case recovered from the operation, but died two months later of an intercurrent disease.

Of these early operators, Récamier only ligated the lower part of the broad ligament before division. Other operations were done without mass ligatures, and without closing the peritoneal wound. In spite of this absence of precautions the bleeding is reported to have been slight. As a rule, subsequent tying was not required.

Unsuccessful cases, however, followed. West[1] has collected 25 cases, of which 22 died. The *Gaz. des Hôp.* of those years describes scenes, horrible in the extreme, where, without anæsthesia, amid the screams and the writhings of the patient the uterus was literally torn away. Both methods were finally abandoned on account of their unfavorable results. No effort to revive them was made by that generation, and dust gathered upon their records, so that when, in 1878, Wm. A. Freund successfully

[1] West, Diseases of Women, 1864, p. 300.

removed the cancerous uterus, he was hailed as a discoverer and as a benefactor.

FREUND'S OPERATION.—Previous to the first operation of Freund, Dr. Emil Noeggerath,[1] of New York, made a somewhat similar effort. He loosened the cervix from the vagina, and then opened the abdomen and attempted to crush through the parametria with the écraseur, but without success. The uterus was left in the cavity, and a few days later the patient died.

Freund[2] operated mainly according to Gutberlet's directions, his distinguishing peculiarities being the previous ligation of the parametria in three portions before division and the complete closure of the pelvic peritoneal wound.

Freund's first operation was done January 30, 1878. A similar operation was done by Billroth[3] April 2, 1878, and by Kocks[4] April 28, 1878, independently and previous to Freund's publication. The earliest cases, as a rule, recovered, and further successful operations were done by Freund, Olshausen,[5] Martini,[6] Kocks, Spiegelberg,[7] and others.

An atmosphere of enthusiasm still lingers around the accounts of this period. A great future was anticipated for the operation; precedence in its history was eagerly sought; and, to secure to Freund the credit which was thought to be his due, Schröder proposed that it should be designated by his name.

The honor soon proved of doubtful value. Additional cases but added to the mortality list. Shock, hemorrhage, the wounding of neighboring organs, and septicæmia were encountered. The operation was very tedious. Three, four, and five hours were consumed in its performance. The third ligature was spoken of as "Zeitraubende." It was peculiarly difficult. Frequently the intestines could not be retained in the cavity, but had to be piled upon the abdomen, and the irritation and actual chill of their from one to three hours' exposure became a factor of importance in the unfortunate result.

The wounding of neighboring parts was not an accident only of the inexperienced. Billroth,[8] Massari,[9] Bardenheuer,[10] Czerny,[11] and Olshausen[12] wounded or included one ureter; Spiegelberg[13] and Œhlschläger[14] included both ureters at the same operation; while Reuss,[15] Spiegelberg,[16] and Bardenheuer wounded the bladder. Hemorrhage was always im-

[1] Noeggerath, Am. Journ. Obst., 1877, p. 105.
[2] Freund, Volkmann's Sammlung, N. 133.
[3] Billroth; see Mikulicz, loc. cit.
[4] Kocks, loc. cit.
[5] Olshausen, Berl. klin. Wochenschr., 1881, p. 497.
[6] Martini; see Freund, Berl. klin. Wochenschr., 1878, p. 418.
[7] Spiegelberg, Bruntzel, Arch. f. Gyn., xiv. p. 245.
[8] Billroth, Wien. med. Wochenschr., 1880, p. 1310.
[9] Massari, Centralblatt f. Gyn., 1879, p. 257.
[10] Bardenheuer, Centralblatt f. Gyn., 1880, p. 140.
[11] Czerny, Wiener med. Wochenschr., 1879, p. 1227.
[12] Olshausen, Berl. klin. Wochenschr., 1881, p. 497.
[13] Spiegelberg, loc. cit., p. 264.
[14] Œhlschläger, Centralblatt f. Gyn., 1879, p. 293.
[15] Reuss, Arch. f. Gyn., xv. p. 139.
[16] Spiegelberg, loc. cit.

minent. Freund himself acknowledged that his third ligature did not make the uterine artery secure. The mortality from septicæmia was great, and the original operation was variously modified.

Kocks[1] separated the uterus from the bladder and rectum before laying the mass ligatures; also, after previous dilatation, he inserted a finger into the bladder to prevent its injury. Kocks reported three cases. Two recovered, one died. Credé[2] widened the field for operation by a partial resection of the anterior pelvic wall. For this purpose the horizontal rami of the pubes were divided so as to leave only a narrow rim of bone just above the clitoris, and about two weeks later the main operation was performed. The abdominal incision was carried to the clitoris by this means. Credé reported but one case, which died in collapse after the main operation. Massari[3] proposed to catheterize both the ureters and the bladder, to prevent wounding and inclusion. He reported but one case, which was unsuccessful. Bardenheuer[4] substituted an open wound with drainage for the closed pelvic peritoneal wound.

It should be especially noted that Bardenheuer, by this method, operated upon ten cases, of which nine recovered, a record which has but recently been surpassed. Breisky and Rydygier[5] incised the vagina and loosened the uterus from the bladder and rectum before making the abdominal incision after the method of Delpech. Kolaczek[6] omitted the peritoneal suture, and also the ligature *en masse*, as not only ineffectual in preventing hemorrhage, but also as likely to do injury to the nerve plexuses, which it would include. M. B. Freund,[7] a brother to the first operator, proposed previously to elevate the uterus with the colpeurynter, to loosen the cervix from the vagina previous to the abdominal incision, to omit mass ligatures and to divide all tissues with the galvanocautery knife.

In spite of all modifications, however, the mortality of the Freund operation remained excessive. Out of 93 cases collected by Kaltenbach, 53 died from its immediate effects, and, with the end of 1879, it ceased to be commonly performed, although in January of the present year Duncan[8] was able to cite 44 additional cases, the mortality remaining at 72 per cent.

Freund[9] himself, at the International Medical Congress, London, 1880, compared the results of his operation with those of the vaginal

[1] Kocks, loc. cit. [2] Credé, Arch. f. Gyn., 1879, xiv. p. 430.
[3] Massari, Arch. f. Gyn., xv. p. 441.
[4] Centralblatt f. Chir., 1880, p. 140; Arch. f. Gyn., 1881, xviii. p. 465; Hegar and Kaltenbach's Op. Gyn., p. 408
[5] Rydygier, Berl. klin. Wochenschr., 1880, p. 642.
[6] Kolaczek, Centralblatt f. Chir., 1881, p. 129.
[7] M. B. Freund, Zeitschr. f. Geb. u. Gyn., vi. p. 358.
[8] Duncan, London Lancet, Jan. 31, 1885.
[9] Trans. Internat. Med. Congress, London, 1880, iv. p. 323.

method then coming into prominence, indicating the latter as the operation of the future.

KOLPOHYSTERECTOMY FOR CANCER.—As Freund's first operation was antedated by that of Noeggerath, Czerny's operation also had a predecessor in the operation of Coudereau,[1] in 1875, and in the operation of Hennig,[2] who, in 1876, successfully removed the cancerous uterus from the vagina by shelling it out of its peritoneal envelope. July 25 Czerny, also, did a subperitoneal enucleation of the uterus for cancer. The patient recovered.

April 12, 1878, Czerny[3] performed the first operation, which, in its main details, represents the operation of to-day. Czerny published this case as a Sauter-Récamier operation. It was apparently done without reference to Freund's directions, as its difficulty was complained of, and the prospect of greater facility by the abdominal section was anticipated, the author subsequently doing two operations according to Freund. Both of these patients died, and Czerny returned to his original plan, but not until 1880, and after Billroth had operated by the vagina upon a number of cases. While, therefore, precedence in reviving the vaginal method belongs to Czerny, the credit for its introduction should be given to others.

Billroth[4] applied the principles laid down by Freund to the vaginal method, and did his first operation December 14, 1879. During 1880 Billroth operated upon six cases. Schröder[5] operated upon eight cases during the same period. The early and full descriptions furnished by Billroth and Schröder gave the first impulse to the movement.

Since Czerny's first operation, extirpation of the uterus by the vagina for cancer has been practised approximately 341 times, as shown in Table I.[6] of this paper, with a total mortality of 27 per cent.

METHODS OF OPERATION.—Czerny[7] drew the uterus firmly downward by hooks which penetrated the cervix or the adjacent tissues. The vagina was then separated from the cervix by a circular incision, the culs-de-sac were opened, and the uterus was everted through one or the other wound; anteverted or retroverted, as the fundus could be the more easily reached. The hooks removed from the cervix were made to engage the fundus in this manœuvre. The peritoneum was secured from retraction by passing through its border a thread of silk. The broad ligaments were then tied in three portions exactly as in Freund's operation,

[1] La Tribune Med., 1875, p. 364. [2] Hennig, Allg. Wein. med. Zeitung. n. 39, 1876.
[3] Czerny, Wien. med. Wochenschr., 1879, p. 197.
[4] Wien. med. Wochenschr., 1880, pp. 1281 *et seq.* [5] Schröder, Zeitschr. f. Geb. u. Gyn., 1881, p. 226.
[6] Of the names of operators noticed in the other lists, those of MacCormac, Tansini, Guarnieri, Leisrink, Lane, Shepherd, and Lange are here omitted; MacCormac (Lancet, Jan. 14, 1882), Shepherd (Mich. Med. News, Feb. 10, 1879), and Lange (N. Y. Med. Record, April 1, 1882), because in each of their cases the abdominal section was made; Tansini and Guarnieri (l. c.), because the operations which they reported were done by Bottini; and Leisrink, because the result of his operation was not known. Lane (Pac. Med. and Surg. Journ., April, 1880) is omitted by mistake.
[7] Czerny, Wien. med. Wochenschr., 1879, p 1197.

the uterus was liberated, and the ligatures were brought out into the vagina. In the majority of Czerny's cases the peritoneum was closed, and the supravaginal wound was united around a drain. In the first cases injections were used, but in the later cases these were replaced by tampons of iodoformized gauze.

Billroth[1] used the circular vaginal incision; employed mass ligatures, which he laid without inverting the uterus; and united the peritoneum around a drain. A second drain was placed in the supravaginal wound, and in some cases permanent irrigation was employed. In his later cases Billroth omitted both sutures and drain, employing the permanent tampon of iodoformized gauze.

Schröder[2] made the circular vaginal incision, drew the uterus down, loosened the cervix from the bladder and rectum, and opened the posterior cul-de-sac first. Then, passing a finger over the broad ligament, and using it as a director, he opened the anterior cul-de-sac. He retroverted the uterus. He tied the broad ligaments *en masse*, using first one ligature and afterward supplementing it by two. He tied one side and divided it before tying the other. He cut the mass ligatures short, and allowed them to escape into the abdominal cavity, or sewed them into the angles of the wound. He made no effort to unite the peritoneal edges, but used drainage, sewing up the supravaginal wound so as simply to embrace the tube.

Olshausen[3] used the circular vaginal incision. He laid a mass ligature upon each side before loosening the cervix. He used silk for his mass ligature, wire supplemented by silk, and subsequently the elastic ligature. He used drainage, both the peritoneal and supravaginal wounds being left open. In his last cases he used tampons of iodoformized gauze.

A. Martin[4] fixed the uterus *in situ*. He first opened Douglas's sac and then laid a mass ligature upon each side, so as to include the peritoneum and the posterior vaginal roof. He divided the attachments of the vagina above this ligature, and guided by his finger in Douglas's sac, he ligated and divided the lateral vaginal wall in the same manner. He retroverted the uterus by means of a sound, bringing it to the floor of Douglas's sac, where it was seized by a hook. He next ligated the remainder of the broad ligament, usually loosening the left side first. Then uniting the anterior peritoneal fold with the anterior vaginal wall, he divided it, and lastly ligated and divided the annexæ of the right side. He washed out Douglas's sac and left a drain in its cavity, closing the vagina with a salicylated tampon. Later the vagina was washed out with a two per cent. carbolic solution three or four times a day. The drainage tube was removed on the sixth or seventh day, and on the tenth day the patient left the bed.

[1] Mikulicz, Wien. med. Wochen , 1880, p. 1281. [2] Berl. klin. Wochen., Dec. 12, 1881, p. 742.
[3] Olshausen, Berl. klin. Wochenschr., 1881, p. 497.
[4] Martin, Berl. klin. Wochenschr., 1881, p. 261; Düvelius, Deutsch. med. Wochenschr., Feb. 26, 1885.

TABLE I.

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
AHLFELD (Sänger), Arch. f. Gyn., 1883, I. 99.	2	.....	.....	.....	.....	1	1		
ANDERSON, Amer. Journ. Obstet., April, 1882, p. 321.	1	.....	Supravaginal amputation followed by sloughing and removal of fundus without opening peritoneum. Posterior wall of bladder implicated and excised, and vulva closed to complete its cavity.	.....	Cervix.	.....	1		
BARDENHEUER (Haidlen), Arch. f. Gyn., xix. I. 106.	1	.....	.....	.....	.....	1	.....		
BAUM, Berl. klin. Wochen., 1880, p. 654.	4	.....	Uterus not inverted; mass ligatures; no peritoneal sutures; drain into cavity; antiseptic tampon; injections when temperature rose.	.....	.....	1 collapse 2 hours after operation. 1 septicæmia 15 days after operation.	2		
BERNAYS, St. Louis Med. Journ., 1884, xlvi. 369; Kolpohysterectomy, Chip. vii, May 15, 1885.	3	.....	Transfixes lateral vaginal wall, and paramet. depth 1 in.; ties, and divides next to the cervix; opens ant. cul-de-sac; anteverts uterus; mass ligatures for broad ligaments; no sutures; no drain; injections of plain water four times in twenty-four hours.	52 years, 4 children.	Portio vaginalis.	.....	1, left bed 28th day.	.....	Well end of 1½ years.
...	.....	.....	.....	.....	.....	.....	2		
BILLROTH (Mikulicz), Wien. med. Wochenschr., 1880, p. 1281, and following; also Berl. klin. Wochenschr., Dec. 12, 1881, p. 742.	12	Dec. 1879	Uterus not inverted; circular vaginal incision; mass ligatures; peritoneal sutures; drain into cavity; permanent irrigation. Duration of operation one hour.	55 years, 5 children.	Portio vaginalis.	1, peritonitis 7 days after operation.			
...	...	March 6, 1880.	.....	29 years, 2 children.	Cervix.	.....	1	End 3 mos.	
...	...	April 18, 1880.	.....	36 years, mar'd, nullip.	Portio vaginalis.	.....	1	Immediate.	
...	...	April 18, 1880.	.....	45 years, 4 children.	do.	1, peritonitis			
...	...	July 24, 1880.	.....	37 years, 1 child.	do.	.....	1		
...	...	Aug. 12, 1880.	.....	42 years, 3 children.	Cervix.	1, peritonitis 34 hrs. after operation.			
...	.....	.....	.....	.....	.....	.....	1		
...	.....	.....	No sutures; iodoform; drain.	.....	.....	1	2		
...	.....	.....	No sutures; no drain; tampon iodoformized gauze, undisturbed for one week.	.....	.....	.....	2		
...	...	.....	.....	41 years,	.....	.....	1, highest	Died May 20,	

Boeckel, Ann. de Gyn., Sept. 1884.	1	Oct. 26, 1883.	Vaginal incision ant. and post.; lateral vaginal walls included in mass ligatures.	41 years,	.....	.....	1, highest temp. 38°.	Died May 20, 1884.	
Bogoluboff, Abstd. Rev. des Sc. Méd., 1883, N. 42, p. 624.	1	.....	.....	.....	.....	.....	1		
Bolling, (Sänger, l. c.)	1	.....	.....	.....	.....	1			
Bompiani, Gaz. Med. di Roma, 1881, viii. 65.	1	.....	Billroth's method. Duration of operation one hour. Hemorrhage.	34 years, 2 children.	Cervix.	1, shock 12 hours after operation.			
Boyt (Mundé), Tr. Am. Gyn. Assoc., 1884.	3	.....	.....	.....	.....	2	1		
Bottini (Tansini), Gaz. Med. Ital. Lombard, April 16, 1881.	5	March 23, 1881.	Schröder's (?) method. Operation one hour.	36 years,	.....	.....	1, highest temp. 38°.		
(Bizozzero), Abstd. C. f. C., 1882, p. 208		.....	Schröder's method. Operation less than one hour.	.....	.....	.....	2	.....	1, end of 6 months.
(Guarnieri), Gaz. degli Osp., Feb. 12, 1882.		1881.	Amputated cervix previous to operation; wounded bladder.	.....	Body.	.....	1		
(Ciceri), Gaz. Med. Ital. Lombard., Feb 28, 1885.		Jan. 9, 1885.	Operation 1½ hours. Profuse hemorrhage.	42 years, 16 children.	Body and cervix.	.....	1, no fever.		
Breisky, Prag. med. Wochenschr., 1883, p. 397.	1	July 7, 1883.	First stuffed cervix, iodoformized gauze; peritoneal suture; drain.	60 years, 4 children.	.....	.....	1		
Brendel, C. f. G., 1883, p. 697.	1	Aug. 25, 1882.	Circular vaginal incision opened ant. cul-de-sac, then post.; mass ligatures; peritoneal sutures; no drain; iodoform tampon changed third day; wounded bladder.	40 years, 6 children.	Portio vaginalis.	.....	1, vesico-vag. fistula.		
Bull, Phil. Med. News, April 5, 1884. (Mundé, l. c.)	2	Feb. 1883.	Mass ligatures; peritoneal sutures; no drain; iodoformized peat bags in vagina; changed 5th day.	45 years.	do.	.....	1	1, 9th month after oper.; end 13 mos. no hem'rh., no disch'ge.	1, 8 months.
	...	.....	.....	.....	.....	1			
Burke, N. Y. Med. Rec., 1882, xxii. 644;	2	.....	.....	.....	Cervix.	.....	1		
N. Y. Med. Journ., June 27, 1883, p. 103.	...	.....	.....	37 years.	do.	.....	1		
Calderini, Abstd. London, Lancet, March 17, 1883.	1	Jan. 16, 1883.	.....	.....	.....	.....	1		
Caselli, Abst. in C. f. G., 1882, p. 80.	1	.....	Uterus retroverted; peritoneal wound left open; no drain.	.....	Body and cervix.	1, peritonitis 11 days after operation.			
Cushing, Am. Journ. Med. Sci., 1882, p. 421.	1	Sept. 4, 1881.	Vaginal incision ant. and post.; lateral walls included in mass ligatures; uterus retroverted; previous wound left open; no drain; injections every two or three days.	47 years, 1 child.	Portio vaginalis.	.....	1		

TABLE I.—*Continued.*

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
CZERNY, Wien. med. Wochen., 1879, 1197; Berl. klin. Wochen., Nov. 13, 1882.	8	July 25, 1878	Langenbeck's subperitoneal enucleation; wounded peritoneum in three places.	57 years,	.....	.....	1		
	...	Aug. 12, 1878.	First modern operation according to the Sauter-Récamier method. Circular vaginal incision; opened ant. or post. cul-de-sac first, whichever reached the fundus most easily; secured the peritoneum from retraction by threads through its border; inverted uterus; used mass ligatures; united the peritoneum; united vaginal wound; drain; no injections; iodoform in last cases. Operation two hours.	33 years, married.	.....	.....	1, vesico-vag. fistula.		
	...	May 14, 1880.	Bladder wounded. Operation three hours.	43 years, 7 children.	.....	1, septic peritonitis 40 hrs. after operation.			
	...	Sept. 27, 1880.	Hemorrhage.	46 years, 1 child.	.....	1, peritonitis 3d day.			
	...	Dec. 18, 1880.	.....	44 years, 5 children.	Cervix.	.....	1	1	
	...	Jan. 1, 1881.	Operation three hours. Severe hemorrhage.	61 years, 7 children.	Cervix.	1, 3 days after oper.			
	...	March 14, 1881.	2 drains, 1 in each angle of wound.	36 years, 10 children.	Portio vaginalis.	.....	1		
	...	Oct. 7, 1881.	Operation two hours; hemorrhage; 60 ligatures used.	47 years, 11 children.	Cervix.	.....	1	1	
DEMONS, Arch. Gén. de Méd., 1883; Bull. et Mém. de la Soc. de Chir. de Paris, 1884, x. 577.	7	Dec. 9, 1882.	Peritoneal wound left open; no drain; tampon iodoformized gauze. Operation 1¼ hours.	30 years.	Cervix and body.	.....	1		
		Jan. 6, 1883.	.....	34 years.	do.	.....	1	.....	1, end of 18 months.
	...	Feb. 22, 1883.	.....	35 years.	Cervix and lower part of body.	.....	1	1, end 9 mos. died 1 year after oper.	1, 8 months.
	...	April 14, 1883.	.....	26 years.	do.	1, peritonitis 4 days after operation.			
	...	June 18, 1883.	Sponge accidentally left in wound.	42 years.	.....	1, peritonitis 3 days after operation.			
	...	July 2,	.....	62 years.	Entire uterus.	1, peritonitis 4 days after operation.			

	...	July 2, 1883.	.....	62 years.	Entire uterus.	1, peritonitis 4 days after operation.			
	...	Feb. 28, 1884.	.....	41 years.	Cervix and inf. portion body.	.....	1		
Dudon (Demons), Arch. Gén. de Méd., 1883, vol. ii. p. 257.	2	.....	.....	.....	.....	1		.....	1, end 2 years.
			Peritoneum closed; drain.	.....	.....	.....	1		
Duncan, Lond. Lancet, Jan. 31, 1885.	2	Jan. 22, 1884.	Schröder's method.	.....	.....	.....	1	1, died 10 months after operation.	
..	...	Feb. 26, 1885.	.....	.....	.....	1, collapse.			
Duvelius, Deutsch. med. Wochenschr., Feb. 26, 1885.	4	May 5, 1883.	Martin's method. Operation 2 hours.	43 years; married.	.....	.....	1, highest temp. 38.7°.	.....	1, 2 years after oper.
	...	Aug. 28, 1883.	Operation 1½ hours.	39 years.	Portio vag.; perametrium free.	.....	1, highest temp. 39°, 8th day.	1, end 2 mos. died end 5 months.	
	...	Feb. 19, 1884.	Operation 50 minutes.	60 years.	Portio vag. and mass in right tube.	.....	1, highest temp. 39°, 9th day.	.....	End 1 year.
	...	Sept. 13, 1884.	.....	49 years; married.	Portio vaginalis.	.....	1, highest temp. 38.1°, 2d day.	.....	1, 5 mos. after oper.
Engström, Abst. in Rev. des Sc. Méd., 1884, p. 595.	2	.....	Peritoneum left open; no drain.	73 years.	Cervix.	1			
	...	.....	.....	65 years.	Cervix.	.....	1		
Esmarch, C. f. C., 1882, p. 71.	2	.....	.....	.....	.....	1	1		
Fenger, Am. Journ. Med. Sc., 1882, p. 17.	1	Sept. 19, 1881.	Operation 2½ hours. Curetted diseased surface; opened both ant. and post. cul-de-sacs; circular vaginal incision; anteverted uterus; used mass ligatures; united the peritoneum; permanent irrigation of supravaginal wound.	40 years, 9 children.	.....	.....	1		
Forman, Australian Med. Gaz., April 15, 1884, p. 143.	1	.....	Martin's method.	40 years, 8 children.	Cervix and lower part of body.	.....	1		
Fritsch, Die Krankheiten der Frauen, 1884, p. 314. (Bokelmann), Arch. f. Gyn., 1884, p. 75; (Heilbrun), C. fr G., Jan. 31, 1885.	24	June 25, 1883.	Curetted the diseased surface; first divides lateral vaginal walls and loosens the cervix from the parametrium, tying singly as cut; then opens ant. cul-de-sac, and unites peritoneum to vag. m. memb. by 3 or 4 sutures; anteverts the uterus, and ties the bd. ligs. in small portions, 6 or 7 each side, dividing them as tied; opens post. cul-de-sac last, and unites peritoneum to m. memb. vagina; leaves peritoneum open; no injections; no drain; dusts wound with iodoform; iodoformized tampon in vagina undisturbed 7–10 days.	36 years, 2 children, 2 miscarriages.	Portio vag.; cauliflower excrescence size of apple.	.....	1, highest temp. 37.7°.		
	...	June 30, 1883.	.....	39 years, 7 children.	Portio vaginalis, body enlarged.	.....	1, highest temp. 38.8°.		

TABLE I.—*Continued.*

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
FRITSCH, loc. cit.	..	Oct. 1, 1883.	.....	44 years, 10 children.	Cervix, body enlarged.	1, shock and septicæmia 3d day.			
	...	Oct. 15, 1883.	.....	42 years, 3 children.	Portio vaginalis.	.....	1, highest temp. 39.1°.		
	...	Nov. 9, 1883.	.....	52 years, 12 children.	Cervix much ulcerated.	1, 4th day occlusion of intestine and collapse.			
	...	Nov. 27, 1883.	.....	34 years, 2 children, last 3 months, previously.	Portio vag. and post. vag. wall.	.....	1, highest temp 37.8°.		
	...	Dec. 1883.	.....	40 years, 6 children.	Cervix.	.....	1, highest temp. 38.2°.		
	...	Feb. 1884.	.....	44 years, 3 children.	Portio vaginalis.	.....	1		
	...	Feb. 1, 1884.	.....	41 years, 6 children.	Cervix, uterus enlarg'd; parametri'm infiltrated.	.....	1, fistula of ureter.		
	...	March 6, 1884	.....	33 years; married.	Portio vaginalis.	.....	1		
	...	April, 1884.	.....	46 years, 7 children.	Cervix.	.....	1, thrombosis saphenous vein.		
	...	May 5, 1884.	.....	39 years, 7 children.	Portio vaginalis.	.....	1		
	...	May 10, 1884.	Tampon removed first 12th day.	77 years, 1 child.	do.	.....	1		
	...	May 12, 1884.	.....	33 years, 3 children.	do.	.....	1		
	...	July 17, 1884.	.....	54 years, 4 children.	do.	.....	1		
	...	Aug. 6, 1884.	.....	37 years, 3 children.	do. no ulcerat'n.	.....	1		
	...	Sept. 1, 1884.	.....	30 years, 4 children.	Portio vag. ulcerated; uterus not enlarged	.....	1		
	...	Sept. 23, 1884.	.....	44 years, 2 children.	Portio vaginalis.	.....	1		
				41 years,	do.	.....	1		

	...	Oct. 7, 1884.	.....	41 years, 4 children.	do.	.....	1	
	...	.....	.....	.....	.....	.....	5	
Gardner (Hayward) Aus. Med. Gaz., May, 1885.	1	Dec. 11, 1884.	Mass ligatures; drain; peritoneum closed.	50 years, 8 children.	.....	1		
Goodell, Am. Journ. Obst., April, 1884, p. 392.	1	.....	Curette and Paquelin previous to operation; circular vaginal incision; retroverted uterus; mass ligatures; peritoneal wound united; sutures in supravaginal wound; dressing, cotton and iodoform.	.....	.....	1, 4 days after operation.	.....	
Giommi, Abst. in Phil. Med. News, May 16, 1885.	1	Feb. 19, 1885.	.....	36 years.	.....	1, 3 days after operation.		
Hahn, Berl. klin. Wochen., 1882, p. 361.	5	Sept. 15, 1881.	Circular vaginal incision; mass ligatures; peritoneal wound left open; no drain; iodoform tampon, operation 1¼ hours.	41 years, 2 children.	Portio vaginalis.	.....	1	
	...	Sept. 15, 1881.	.....	54 years, several child.	Portio vag.; left paramet. infiltrated.	1, of consecutive bronchitis		
	...	Jan. 24, 1882.	.....	25 years, 3 children.	Portio vaginalis.	.....	1	
	...	Feb. 21, 1882.	.....	28 years; married.	Cervix.	.....	1	
	...	May 5, 1882.	.....	37 years, 4 children.	Portio vaginalis.	.....	1	
Helferich, Abst. in Schmidt's Jahrbuch., N. 194, p. 152.	1	.....	Bladder wounded; intestines prolapsed.	58 years.	.....	.....	1	
Heff, Arch. f. Gyn., 1885, p. 315.	1	.....	Fritsch's method, modified by wider lateral vaginal incision.	49 years, 2 children.	.....	.....	1, highest temp. 38.1°. 5th day.	
Holmer (Howitz, l. c.)	1	.....	.....	.....	.....	.....	1	
Howitz, Abst. C. f. G., 1883, 438.	2	Sept. 20, 1882.	Vagina incised, ant. and post.; mass lig.; periton'm closed; drain; iodoform; wounded bladder; operation 4½ hours.	57 years, 13 children.	Portio vaginalis.	.....	1	
	...	Oct. 12, 1882.	.....	41 years, 12 children.	Portio vag. rt. paramet.	.....	1	
Johannovsky, Prag. med. Wochen., Nov. 14, 1883, p. 449.	1	Aug. 18, 1883.	Vagina incised, ant. and post.; uterus retroverted; mass ligatures; peritoneal wound left open; drain; iodoform.	51 years, 8 children.	Cervix and body.	.....	1	
Kocher, Abst. C. f. C., 1882, p. 164.	1	.....	No sutures; no tube; antiseptic tampon and injections.	.....	.....	.....	1	1, end 3 w'ks after oper.
Kraussold, C. f. C., 1883, x. p. 17.	2	.....	Uterus anteverted; mass ligatures; peritoneal wound left open; drain; vaginal tampon of iodoformized gauze.	41 years; was a 2d wife: 1st wife also had uterine cancer.	.....	.....	1	
	...	April 12, 1882.	.....	39 yrs., 3 child. many abort'ns; husb. syphil.	Portio vaginalis.	.....	1	

TABLE I.—*Continued.*

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
KUFFERATH, Ann. de Gyn., July, 1884, p. 46.	1	Sept. 22, 1883.	.....	45 years, 2 children.	Cervix.	.....	1	1, 5 hours after oper.	
LEBEDEV, Index Medicus, Aug. 1885.	2	.....	.....	.....	.....	.....	2		
MARTIN,[1] A., Arch. f. Gyn., 1882, XX. 291; Path. u. Ther. der Frauenkheiten, 1885, p. 303.	52	Before 1882.	Curettes diseased surface previous to operation; cervix is strongly pulled toward the pubes to prevent prolapse of intestines; posterior cul-de-sac is opened first; uterus is not inverted; bottom of cul-de-sac is united to vagina before further division; ant. cul-de-sac is opened last; mass ligatures for broad ligaments; peritoneum not united; drain; tampon.	.....	.....	8	23		
	...	1882–84.	.....	.....	.....	4	17		
MANDILLON (Demons), Arch. Gén. de Méd., 1883, ii. p. 267.	...	.....	Peritoneal sutures and drain.	.....	.....	.....	1		
MÜLLER, P., Wiener med. Wochen., Feb. 23, 1884, p. 214.	4	.....	Vagina incised ant. and post.; lateral walls left intact until uterus retroverted; provisional mass ligatures each side over brd. ligs.; uterus divided vertically before removal; no peritoneal sutures; no drain; sublimate injections two or three times daily; carbolized tampon.	.....	.....	.....	4		
MUNDÉ, Trans. Am. Gyn. Assoc., 1884; N. Y. Med. Journ., July 25, 1885.	3	Oct. 10, 1883.	United peritoneum by stitches, including supravaginal wound; drain.	.....	.....	.....	1, drain removed 7th day.	1, end of 1 year.	
	...	Nov 9, 1883.	Schröder's method; hemorrhage from post. vaginal wall concealed by speculum.	.....	.....	1, 4 hours after oper'n shock and hemorrh'ge.			
	...	.....	.....	.....	.....	1			
NOEGGERATH, (Mundé, l. c.)	3	.....	.....	.....	.....	3			
NOVARO (Caponotes), Abst. C. f. G., April, 1885.	20	.....	.....	.....	.....	10	10		
OLSHAUSEN, Ber. klin. Wochen., 1881, p. 407; Arch. f. Gyn., 1882, p. 291; Beiträge zur Gyn., 1884, p. 107.	32	April 2, 1881.	Circular vaginal incision; mass ligatures, silk, wire, or elastic; no peritoneal sutures, but always drainage tube into peritoneal cavity.	61 years; married; nullip.	Body.	.....	1		
		April 11, 1881.	Operation two hours.	45 years, 5 children.	Portio vaginalis.	.....	1		
		May 28, 1881.	Collapse during operation; rallied with difficulty.	48 years, 1 child.	Cervix.	.....	1		
		June 13,	Hemorrhage during operation.	36 years, 10 children.	do.	.....	1		

[1] Düvelius's statement of 55 cases, with 5 deaths, is here omitted because the point from which it overlaps the older reports is not apparent.

Devereux's statement of 55 cases, with 5 deaths, is here omitted because the point from which it overlaps the older reports is not apparent.

	...	June 13, 1881.	Hemorrhage during operation.	36 years, 10 children.	do.	.....	1		
	...	June 27, 1881.	Prolapse of intestines; collapse during operation.	39 years, 1 child.	Portio vaginalis.	.....	1		
	...	July 29, 1881.	Collapse during operation.	34 years; married.	do.	.....	1		
	...	.....	.....	.....	.....	6	11	1, died 15 months after operation.	
	...	.....	.....	.....	.....	1	8	1, died 17 months after oper. 1.	
Paggi, Lo Sperimentale, 1882, ii. 487.	1	Sept. 18, 1882.	Billroth's method.	45 years.	Portio vaginalis.	1, 32 hours after oper.			
Peruzzi, Gaz. degli Osp., May 7, 1884.	1	March 8, 1884.	.....	34 years.	Cervix.	.....	1		
Pawlik, Wien. klin., 1882, p. 403.	1	April 1, 1880.	Uterus retroverted; mass ligatures; open peritoneal wound; drain; cancerous mass not all removed.	35 years, 8 children.	Cervix, cys. brd. ligam't infiltrated.	....	1	1, 5 mos. aft'r oper.; died 9 months after operation.	
Purcell, London Lancet, Jan. 31, 1885.	1	Sept. 23, 1884.	No peritoneal sutures; drain.	.....	.....	.....	1, highest temp. 101.4°		
Sänger, (Sänger, Leipzig, l. c.)	2	.....	.....	.....	.....	1	1		
Sänger (Leipzig), Arch. f. Gyn., 1883, xxi. 99.	2	Oct. 18, 1881.	Circular vaginal incision; uterus retroverted; mass ligatures; peritoneum closed; iodoform; no drain; hemorrhage during operation.	56 years, 5 children.	Cervix.	.....	1	1, died 10 mos. after operation.	
	...	.....	.....	36 years.	do.	.....	1		
Schatz, Arch. f. Gyn., 1883, xxi. III. 409.	10	Feb. 26, 1881.	First opened Douglas's sac and then united the bottom of cul-de-sac to vagina by a peculiar "kettennaht;" retroverted uterus; tied and divided bd. ligs. in short sections; divided peritoneum ant. cul-de-sac last; left peritoneal cavity open. Patient occupied half sitting posture in kind of chair. No drain; no injections.	55 years, 6 children.	Body.	.....	1	.....	1, end of 1½ years.
	...	March 11, 1881.	.....	24 years, 3 children.	.....	.....	1	1, died 31 weeks after operation.	
	...	Aug. 24, 1881.	.....	48 years, 2 children.	.....	.....	1		
	...	Sept. 21, 1882.	.....	55 years, 7 children.	Cervix.	.....	1		
	...	Sept. 26, 1882.	.....	44 years, mrd., nullip.	Body (much enlarged).	.....	1		
	...	Sept. 30, 1882.	....	54 years, 1 child.	Body and cervix.	.....	1	1, 6 months after oper.	
	...	Dec. 29, 1882.	.....	53 years, 8 children.	Body.	1, peritonitis 4th day.			
	...	.....	Included ureters.	52 years, 2 children.	Cervix.	1, 7th day.			

TABLE I.—*Continued.*

Operator, and where reported.	No. of cases.	Date of operation	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
SCHATZ, loc. cit.	...	.....	.....	52 years, 2 children.	Body.	.....	1		
	...	.....	.....	42 years, 4 children.	Portio vaginalis.	1, 3 hours after oper.	.....		
SCHEDE, Berl. klin. Wochen., 1880, p. 318.	2	.....	Billroth's method.	.....	.....	1, lived 4 dys 1, 2d day.			
SCHRÖDER, Zeitschr. f. Geb. u. Gyn., 1881, p. 226; Br. Med Journ., Sept. 15, 1883; (Hofmeier) Zeitschr. f. Geb. u. Gyn., 1884,	34	May 17, 1880.	Retroverted uterus; mass ligatures; no peritoneal sutures, but vaginal wound united around drain.	.....	Cervix.	.....	1		
	...	May 19, 1880.	.....	.....	do.	.....	1		
	...	May 20,	.....	.....	do.	.....	1		
	...	July 1,	.....	.....	do.	.....	1		
	...	July 26,	.....	.....	do.	.....	1		
	...	July 30,	.....	.....	do.	1, 3 hours after oper.			
	...	Dec. 6,	.....	.....	.....	.....	1		
	...	Aug. 29,	.....	.....	.....	.....	1		
	...	.....	.....	.....	.....	6	14	.....	2, end of 2 years; 2, end 1 year.
	...	.....	.....	.....	.....	2	4		
SIMPSON, Edinb. Med. Journ., 1882–3, p. 425.	1	May 23, 1882.	Used cautery knife; divided uterus vertically, according to method of Müller; secondary hemorrhage. Does not consider the cautery safe as ligatures and knife.	39 years, 6 children.	.....	1, collapse.			
SOLOVIEFF, Abstd. Rev. des Sc. Méd., 1883, N. 42, p. 624.	1	.....	Billroth's method.	53 years.	.....	.....	1		
SOLOVIEFF, Abst. in C. f. G., 1882, p. 607.	1	.....	Schröder's method.	33 years.	Cervix.	.....	1		
STARCK, Berl. klin. Wochen., March 20, 1882.	1	Aug. 2, 1881.	No mass ligatures; no sutures; no drain; vagina filled with Lister's gauze; ureter was implicated; the diseased part was excised; central extremity tied, and one week later extirpation of the kidney was performed.	42 years, 7 children.	Portio vag., parametrium invaded.	.....	1		
STAUDE, Deutsch. med. Wochen., 1883, p. 659; (Schütz) C.f. G., Feb. 7, 1885.	16	June, 1882.	Thorough disinfection; circular vaginal incision; uterus retroverted; mass ligatures; ant. cul-de-sac divided last; stumps sunken; peritoneum united, and supravaginal wound sewed up around drain; iodoform.	.....	Cervix and body.	.....	1	1, end 1 yr.	
	...	.....	.....	33 years.	Cervix.	.....	1		

	...	.....	.....	.....	do.	.....	2	1 months.	
	...	.....	Peritoneal suture difficult; collapse during operation.	.....	Portio and cervix.	.....	1	1, end 12 weeks.	
	...	Jan. 1881.	.....	46 years, 3 children.	Cervix and body.	.....	1, highest temp. 38.5°.	1, end 1½ years.	
	...	Nov. 1880.	Operation three hours, difficult; left ureter involved in disease, and excised.	50 years.	Cervix.	.....	Died 1⅓ yr. later general prostration; no local return.		
	...	.....	....	.....	.....	.....	10		
Stewart, Trans Ill State Med Soc, xxii. 1883, p. 192.	1	.....	.....	35 years, 4 children.	.....	.....	1		
Studsgaard (Howitz, l. c).	1	.....	....	.....	.....	.....	1		
(Not designated Howitz, l. c,)	2	.....	....	.....	.....	2			
Tauffer, Arch. f. Gyn, 1884, xxiii. p. 367.	5	Oct. 2, 1881.	Previous use curette or clamp to diseased part; uterus retroverted; peritoneum secured from retraction by silk thread; peritoneum closed; vaginal wound united around drain.	30 years, 9 children.	Cervix.	1, 3d day septicæmia.			
	...	June 22, 1883.	Iodoform.	28 years, 2 children.	.....	.....	1	.....	1, end of 1 year.
	...	Oct. 23, 1883.	.....	40 years, mar'd nullip.	Cervix.	.....	1	.....	1, end 6 months.
	...	Nov. 10, 1883.	.....	44 years, 8 children.	.....	.....	1		
	...	Nov. 15, 1883.	Applied chromic acid two weeks previous to operation; tampon first removed 5th day; ligatures removed 22d day; left bed 24th day.	.....	.....	.....	1	.....	1, end of 6 months.
Terrier Gaz. des Hôp, 1885, p. 606; (Trélat) Gaz. des Hôp, 1885, p. 669.	2	.....	Mass ligatures; stumps treated like ovariotomy pedicle; open peritoneal wound; drain; single suture in supra-vaginal wound.	.....	.....	1	1		
Teuffel, V. (Haidler), Arch. f. Gyn., xix. p. 106.	5	June 12, 1880.	Opened Douglas's sac high as possible; secured peritoneum from retraction; placed sponge in cavity; retroverted uterus; mass ligatures including lat. vag. wall; peritoneum closed leaving stumps out; no tampon; operation five hours.	50 years, 2 children.	Cervix.	.....	1	.....	1, end of 1½ years.
	...	Aug. 31, 1880.	.....	33 yrs., 8 child. in ten years,	Cervix.	.....	1	1, immediate.	
	...	Nov. 22, 1880.	Operation 2½ hours.	35 years, 4 children.	Body.	1, 3d day, sepsis.			
	...	May 3, 1881.	Operation 5 hours.	45 years, 8 children.	Portio vaginalis.	1, 4th day, sepsis.			
	...	May 5, 1881.	Operation 2½ hours.	45 years, 4 children.	Cervix.	1, septicæmia.			

TABLE I.—*Concluded.*

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
THIERSCH (Sänger, l. c.)	4	.....	.....	.....	.....	1	3		
TILLAUX.	1	.....	Vag. incised, ant. and post.; peritoneum left open; drain; single vaginal suture; iodoformized tampon.	.....	.....	.....	1		
TRÉLAT, Gaz. des Hôp., July 23, 1885.	1	July 2, 1884.	.....	.....	.....	.....	1	.....	1, end of 1 year.
VECCHI, DE, San Francisco, Lancet, May, 1883, Abst. in C. F. G., 1883, p. 695.	1	.....	Mass ligatures; uterus liberated by galvanocautery wire; salicylated tampon.	53 years.	.....	.....	1		
VEIT, J., Deutsch. med Wochen., Jan. 3, 1883.	2	.....	.....	65 years, 7 children.	Body.	.....	1		
			Schröder's method.	58 years, virgin.	Body.	.....	1		
WALLACE, Br. Med. Journ., Dec. 1884.	3	Jan. 31, 1884.	Previously cut away diseased tissue with bistoury; retroverted uterus; used elastic mass ligature secured from sliding by harelip pin; closed supravaginal wound; no drain; patient left in half sitting position.	.....	.....	.....	1, highest temp. 100.5°		
	...	April 28, 1884.	.....	47 years, 8 children.	Cervix and vag.; nodule rt. brd. lig.	.....	1		
	...	May 21, 1884.	Operation difficult.	56 years.	Cervix, cavity in uterus 3¼ in.	1, collapse 24 hours after oper.			
WEIR, Phil. Med. News, June 17, 1885.	1	Nov. 10, 1884.	Anteverted uterus; mass ligatures; opened post. cul-de-sac last; united peritoneum; iodoformized peat bags in vagina; no drain.	40 years.	.....	.....	1		
WILE, N. Eng. Med. Mo., 1882-3, ii. 207.	1	.....	.....	.....	.....	1, 4th day.			
WILLETS (Mason), St. Barth. Hosp. Rep., 1883, xix. p. 111.	2	.....	.....	34 years,	.....	1, peritonitis	.....	1, end 10 months.	
ZWEIFEL, C. f. G., June, 28, 1884.	3	June, 1882.	Vag. incised ant. and post.; uterus retroverted and divided vertically; no mass ligatures; no sutures; no drain; iodoformized tampon.	37 years, 35 years, 12 children.	Cervix.	..... 1, peritonitis 3d day.	1		
	...	.....	.....	.....	Cervix. Cervix; body enlarged; fundus half way to umbilicus.	.....	1, highest temp. 38.2°, 3d day.	.....	1
	...	April, 1884.	Bowels first evacuated twelfth day.	.....	Cervix.	.....	1		
Total,	341	.....	.....	.....	.....	93	248		

Martin's method is distinguished by the fact that he operates *in situ*, that he ligates the vaginal wall before incision, and that he covers the supravaginal wound. For his latest cases Martin has used the tampon of iodoformized gauze.

Schatz[1] also first opened Douglas's sac and united the vaginal wall to the bottom of the cul-de-sac by a chain of stitches before division. Schatz's method is further distinguished by the fact that he opened Douglas's sac to its deepest portion, that he left the peritoneal cavity freely open, and that he used no tube. During convalescence the patient was made to maintain a semi-erect position by reclining in a kind of chair.

Von Teuffel,[2] on the contrary, opened Douglas's sac as high as possible. He used mass ligatures which included the lateral vaginal wall. He used peritoneal sutures, completely closing the cavity and leaving the stumps out. He used neither tampon nor drain.

Baum[3] left the peritoneal wound open and used a tube. He did not use prophylactic injections, but only when the temperature commenced to rise. He removed the drainage tube on the fifth or sixth day.

Müller[4] cut anteriorly and posteriorly, leaving the lateral walls of the vagina intact until the uterus had been turned out. The uterus was inverted through the posterior wound. He then passed a thick provisional ligature around each broad ligament, including the lateral vaginal wall, and divided the uterus vertically into halves before removing it. He ligated the vessels separately, both in the stumps and in the vaginal wall. He sank the stumps, using no sutures, and closing the vagina with a carbolized tampon. This division of the uterus before removal had been previously suggested by Corradi.[5]

Fritsch[6] divides the lateral vaginal wall first, penetrating as deeply as possible and ligating vessels as they are encountered. He next opens the anterior cul-de-sac, and unites the peritoneal border with the anterior vaginal wall by three or four sutures. He then anteverts the uterus and ties the broad ligaments in small sections, dividing them as tied, six or seven ligatures being employed upon each side. He opens the posterior cul-de-sac last, finally uniting the peritoneum with the vagina as before. He leaves the peritoneal cavity fully open, and uses no drain, but dusts the wounded surfaces with iodoform, and packs the vagina with iodoformized gauze, which has been undisturbed from seven to ten days.

Hahn[7] tied and divided the broad ligaments in small sections, cut his ligatures short, left the wound fully open, and used no drain. He blew

[1] Schatz, Arch. f. Gyn., 1883, xxi. p. 409.
[2] Haidlen, Arch. f. Gyn., xix. p. 106.
[3] Baum, Arch. f. Gyn., xiv. p. 481.
[4] Müller, Wien. med. Wochenschr., Feb. 23, 1884.
[5] Trans Internat. Med. Congress, London, 1880, iv. p. 325.
[6] Fritsch, Die Krankheiten der Frauen, 1884, p. 314; Bokelmann, Arch. f. Gyn., 1884, p. 75.
[7] Hahn, Berl. klin. Wochenschr., 1882, p. 361.

a drachm of iodoform into the wound and filled the vagina with iodoformized gauze.

Sänger,[1] while advocating a complete peritoneal seam, in his own cases, left the wound open, and used no drainage. Sänger employed iodoform, but considered the quantity used by Schatz dangerous. He blew in about a gramme and used iodoformized tampon.

Staude[2] makes a circular vaginal incision, retroverts the uterus, uses mass ligatures, and divides the anterior cul-de-sac after the other uterine attachments have been divided. He completely closes the peritoneum and unites the vagina around a drain.

Tauffer[3] also retroverted the uterus. He closed the peritoneum and united the supravaginal wound around a drain.

Demons[4] leaves the peritoneum open and uses no drain, but a tampon of iodoformized gauze.

Terrier[5] uses mass ligatures tied like the ligature of the ovariotomy pedicle, leaves the peritoneal wound open, and draws the supravaginal wound together by a single suture about a drain.

Bottini[6] first called attention to the value of previous amputation of the diseased cervix. Otherwise he proceeds, in the main, according to Schröder's method.

Simpson[7] divided the uterus vertically and used the cautery in its removal. He had secondary hemorrhage, and remarked that another time he would preferably rely upon ligatures and the knife.

Wallace[8] previously cuts away the diseased tissue with a bistoury, retroverts the uterus, and uses elastic mass ligatures, preventing them from sliding by the harelip pin. He does not try to unite the peritoneal edges, but closes the supravaginal wound, using no drain. The patient is kept in a half-sitting position, after the operation, according to Schatz's directions.

Fenger[9] anteverted the uterus, used mass ligatures, and united the peritoneum, using a drain and permanent irrigation in the supravaginal wound.

Mundé,[10] in the main, follows the method of Schröder.

Bernays[11] first lays two mass ligatures, including the vaginal walls and the parametria so far as they can be reached. He then divides the vagina within these ligatures by a circular incision, opens the anterior cul-de-sac, anteverts the uterus, ties the upper part of the broad ligament, and divides it, and later the lower part. He brings the ligatures into the

[1] Sänger, Arch. f. Gyn., 1883, xxi. p. 99.
[2] Staude, Deutsch. med. Wochenschr., 1883, p. 659.
[3] Tauffer, Arch. f. Gyn., 1884, xxiii. p. 367.
[4] Demons, Arch. Gén. de Méd., 1883, vol. ii. p. 257.
[5] Terrier, Gaz. des Hôpitaux, 1885, p. 606.
[6] Tansini, Gaz. Med. Ital., Lombard, April 17, 1881; Bizzozero, Cent. f. Chir., 1882, p. 208.
[7] Simpson, Edin. Med. Journ., 1882–83, p. 425.
[8] Wallace, Brit. Med. Journ., Dec. 1884.
[9] Fenger, Am. Journ. Med. Sci., 1882, p. 17.
[10] Mundé, Trans. Am. Gyn. Assoc., 1884.
[11] Bernays, St. Louis Med. and Surg. Journ., p. 369, 1884.

vagina, and uses no sutures, tampon, nor drain. Injections of pure water are made four times in the twenty-four hours. No disinfectant is used either during the operation or during the subsequent treatment.

THE TOTAL AVERAGE MORTALITY.—Statistics in regard to the mortality of kolpohysterectomy have been at different times collected.[1] According to these figures, the mortality from the operation would appear to have increased during the first years of its performance. Careful examination of the records now at our command does not, however, sustain this view. Many of the operations done during the first years were not reported until later, and, hence, their failures lowered the percentage of a more successful date.

The proof of this assertion is found in Table II. of this paper, where the 341 cases are tabulated according to the date of the operation where it could be found, this list being added to a supplementary list made up of operations whose date is not given, and which were classified according to the date of the report. While the results of this computation are also open to criticism, it is evident that they must approach more nearly to accuracy than do those of lists made out entirely from the date of the report.

The total mortality at the end of				1880	was	37	per cent.
"	"	"	"	1881	"	31	"
"	"	"	"	1882	"	29	"
"	"	"	"	1883	"	29	"
"	"	"	"	1885[2]	"	27	"

THE MORTALITY FOR SEPARATE YEARS.—The record for separate years shows the same steady improvement. As shown by Table II.:

Cases done previous to the end of				1880,	had a mortality of	37	per cent.
"	"	or reported during		1881,	"	27	"
"	"	"	"	1882,	"	27	"
"	"	"	"	1883,	"	28	"
"	"	"	"	1885,	"	24	"

The increased mortality shown by the list for 1883 is manifestly due to the great number of scattered cases of remote date, which were during that period reported. The mortality of the cases in which the operation was actually done during 1883 was but 22 per cent.

[1] Kaltenbach, Op. Gyn., 409, 1880, collected a total of 29 cases, with a mortality of 27 per cent.; Olshausen, Berl. klin. Wochenschr., 1881, No. 35, 41 cases, with a mortality of 29 per cent.; Haidlen, Arch. f. Gyn., xix. p. 106, 52 cases, with a mortality of 37 per cent.; Czerny, Berl. klin. Wochenschr., 1882, Nos. 46 and 47, 81 cases, with a mortality of 32 per cent.; Sänger, Arch. f. Gyn., 1883, h. 1, p. 99, 133 cases, with a mortality of 28 per cent.; Mundé, Trans. Am. Gyn. Assoc., 1884, 254 cases, with a mortality of 28 per cent.; Duncan, Brit. Med. Journal, Jan. 31, 1885, 276 cases, with a mortality of 28 per cent.; Doche, l. c., also a list, with a mortality of 28 per cent.

[2] The results of 1884 and 1885 are tabulated together, because a fairer percentage can thus be obtained, the report for 1885 being yet necessarily imperfect.

TABLE II.

OPERATIONS PERFORMED OR REPORTED DURING THE YEARS 1884–85.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Bernays	2	0	2	Bopp	3	2	1
Bottini	1	0	1	Bull	1	1	0
Demons	1	0	1	Duncan	1	0	1
Düvelius	2	0	2	Engström	2	1	1
Fritsch	17	0	17	Foreman	1	0	1
Gardner	1	1	0	Goodell	1	1	0
Glomni	1	1	0	Herff	1	0	1
Mundé	1	1	0	Lebedev	2	0	2
Peruzzi	1	0	1	Martin	21	4	17
Purcell	1	0	1	Müller	4	0	4
Trélat	1	0	1	Noeggerath	3	3	0
Wallace	3	1	2	Novaro	20	10	10
Weir	1	0	1	Olshausen	9	1	8
Zweifel	2	0	2	Schröder	6	2	4
				Staude	10	0	10
				Terrier	2	1	1
				Tillaux	1	0	1
Total	35	4	31	Total	88	26	62
Mortality	11 per cent.			Mortality	29 per cent.		

Total operations performed and reported during the years 1884–85 . 123 30 93
Mortality . . . . . 24 per cent.

OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1883.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Bernays	1	0	1	Ahlfeld	2	1	1
Boeckel	1	0	1	Bogoluboff	1	0	1
Breisky	1	0	1	Bolling	1	1	0
Bull	1	0	1	Burke	1	0	1
Calderini	1	0	1	Dudon	2	1	1
Demons	5	3	2	Duncan	1	1	0
Düvelius	2	0	2	Holmer	1	0	1
Fritsch	7	2	5	Mandillon	1	0	1
Johannovsky	1	0	1	Sänger (G.)	2	1	1
Kufferath	1	0	1	Sänger (L.)	1	0	1
Mundé	2	1	1	Schatz	3	2	1
Tauffer	4	0	4	Schröder	20	6	14
				Solovieff	1	0	1
				Solowiew	1	0	1
				Staude	3	0	3
				Stewart	1	0	1
				Studsgaard (Howitz)	1	0	1
				Thiersch	2	2	0
				Vecchi, de	4	1	3
				Veit, J.	1	0	1
				Willets	2	0	2
					2	1	1
Total	27	6	21	Total	54	17	37
Mortality	22 per cent.			Mortality	31 per cent.		

Total operations performed and reported during the year 1883 . 81 23 58
Mortality . . . . . 28 per cent.

OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1882.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Brendel	1	0	1	Anderson	1	0	1
Hahn	3	0	3	Bottini	2	0	2
Howitz	2	0	2	Burke	1	0	1
Kraussold	2	0	2	Demons	1	0	1
Paggi	1	1	0	Esmarch	2	1	1
Schatz	4	1	3	Helferich	1	0	1
Simpson	1	1	0	Martin	31	8	23
Staude	1	0	1	Olshausen	17	6	11
Zweifel	1	1	0	Wile	1	1	0
Total	16	4	12	Total	57	16	41
Mortality	25 per cent.			Mortality	28 per cent.		

Total operations performed and reported during the year 1882 . 73 20 53
Mortality . . . . . 27 per cent.

Operations Performed or Reported during the year 1881.

Performed.	No.	Died.	Rec.
Bottini	2	0	2
Cushing	1	0	1
Czerny	3	1	2
Fenger	1	0	1
Hahn	2	1	1
Olshausen	6	0	6
Sänger	1	0	1
Schatz	3	0	3
Starck	1	0	1
Staude	1	0	1
Tauffer	1	1	0
Teuffel	2	2	0
Total	24	5	19
Mortality	20 per cent.		

Reported without date.	No.	Died.	Rec.
Bardenheuer	1	1	0
Bompiani	1	1	0
Billroth	6	1	5
Caselli	1	1	0
Kocher	1	0	1
Total	10	4	6
Mortality	40 per cent.		

Total operations performed or reported during 1881	34	9	25
Mortality	27 per cent.		

Operations Performed before and during 1880.

Performed.	No.	Died.	Rec.
Baum	4	2	2
Billroth	6	3	3
Czerny	5	2	3
Pawlik	1	0	1
Schede	2	2	0
Schröder	8	1	7
Staude	1	0	1
Teuffel, v.	3	1	2
Total	30	11	19
Mortality	37 per cent.		

	No.	Died.	Rec.
Total operations performed before and during the year 1880	30	11	19
Mortality	37 per cent.		
Total operations performed and reported during the years 1881, 1880	64	20	44
Mortality	31 per cent.		
Total operations performed and reported during the years 1882, 1881, 1880	137	40	97
Mortality	29 per cent.		
Total operations performed and reported during the years 1883, '82, '81, '80	218	63	155
Mortality	29 per cent.		
Total operations performed and reported during 1884–5, '83, '82, '81, '80	341	93	248
Mortality	27 per cent.		

The report of the single operator, as shown by Table II., is also of interest. Previous to 1881 Billroth lost 3 out of 6 cases; subsequently Billroth lost but 1 out of 6 cases. Schröder, on the contrary, previous to 1881 lost but 1 out of 8 cases, while subsequently he has lost 6 out of 20, and 2 out of 6. In 1882 Martin reported himself as having lost 8 out of 31 cases, while in 1885 Düvelius reports him as having lost but 5 out of 55. In 1881 Olshausen operated 6 times successfully; in 1882 he reported 6 deaths out of 17 additional cases; and in 1884 10 additional, of which he lost but 1. In 1883 Fritsch lost 2 out of 7 cases. In 1884 and 1885 he reported 17 additional cases, without a death. Staude, a recent operator, has done 16 operations, without a death.

Mortality According to the Treatment of the Wound.—The history of this operation is but a short one, yet two distinct periods of advancement in its results may be distinctly traced. The first occupies 1881 and 1882, during which the total mortality fell from 37 per cent. to 29 per cent. The second occupies the years of 1884 and 1885, during which the total mortality has fallen from 29 per cent. to 27 per cent.

The first of these periods corresponds with the introduction of iodoform in the treatment of wounds. The second has coincided with the adoption of certain precautions in the course of the operation itself, and certain further peculiarities in the subsequent treatment.

In all recent operations the diseased cervix has been either amputated, curetted, or cauterized previous to the first incision.

The different methods of subsequent procedure vary, first, in the vaginal incision, which has been circular according to the most common practice, but which has also been confined to the anterior and posterior walls, the lateral walls being retained to be included in the mass ligatures, as done by Müller and Bernays, or confined to the lateral walls for the division and securing of the uterine artery, previous to the anterior and posterior division, as practised by Fritsch. The different methods vary, secondly, in the position of the uterus, which may be fixed *in situ*, as done by Martin; simply pulled down, as done by Billroth; retroverted and the fundus made to present at the vulva, as done by Schröder; or anteverted and brought out through the anterior cul-de-sac, as done by Czerny in a number of cases. Thirdly, they may differ in the order of the opening of the cul-de-sacs, whether both be opened previous to the eversion of the uterus, as is the commonest practice, or whether the anterior cul-de-sac only be opened where the uterus is turned out by anteversion, or the posterior cul-de sac only be opened where the uterus is turned out by retroversion, until the broad ligaments have been tied and divided, and the uterus prepared for complete removal. This precaution prevents any secretion of the uterus from penetrating the cavity of the peritoneum during inversion. They differ, fourthly, in the use of the mass ligature, whether one, two, three, or many; whether the whole ligament be secured and divided at once, as was done in the earlier operations; whether it be tied in small sections and divided step by step, as done by Fritsch; or whether, on the other hand, vessels be tied separately as encountered, with or without a provisional mass ligature. They differ, fifthly, in the treatment of the mass ligatures, whether they be cut short and sunken, or whether they be kept long and brought out into the vagina to assist in drainage. Sixthly, they differ in the treatment of the peritoneal wound, whether it be completely closed, as done by v. Teuffel; be united around a drain, according to the early practice of Billroth; be left completely open with a drain, as practised by Martin, Baum, Olshausen, and by Billroth in some later cases; or whether it be left completely open without a drain, as practised by Fritsch, Demons, Müller, Billroth, Schatz, Bernays, and others. They differ, seventhly, in the treatment of the supravaginal wound, whether it be closed around a drain, as done by Schröder; closed without a drain, as done by Goodell and Wallace; left completely open, with or without a drain; or whether it be covered by peritoneum,

the peritoneum of the cul-de-sac being united to the mucous membrane of the vagina, as practised by Martin, Schatz, Fritsch, and Von Herff. They differ, eighthly, in the use or omission of injections, or the tampon of iodoformized gauze.

If we except the previous treatment of the diseased part by amputation, the curette, or the caustic, and the protection of the peritoneal cavity during inversion of the uterus, the contested points here enumerated concern only questions of facility in operation until we arrive at the treatment of the wound, which supremely concerns the immediate mortality of the result.

In Table III. of this paper is a statement of the mortality list, classified according to the treatment of the wound, where this has been detailed. This Table utilizes 280 cases having a total mortality of 23 per cent. As the total average mortality of the whole number of cases is 27 per cent., it is apparent that Table III. cannot give an exaggerated impression of the mortality list; that if all cases had been detailed, the true mortality list for any method would have been higher rather than lower than that here obtained. Full credit, therefore, may be given to this Table, wherever, by falling below the average, it proves the failure of a method.

Of the 280 cases, in 58 the peritoneal wound was closed either with or without a drain, with a mortality of 28 per cent. In 20 of these the supravaginal wound was left open with a drain, with a mortality of 40 per cent., while in 30 cases the supravaginal wound was closed around a drain, with a mortality of 13 per cent. In 8 cases the supravaginal wound was left open without a drain. Of these 8, 4 died.

On the other hand, in 222 cases the peritoneal cavity was left open with and without a drain, with a mortality of 22 per cent. In 81 of these cases the supravaginal wound was left open with and without a drain, with a mortality of 23 per cent., while in 141 cases the supravaginal wound was closed, with a mortality of 21 per cent. Of the 141 cases, in 48 cases the supravaginal wound was drawn together, completely, or around a drain, with a mortality of 27 per cent.; and in 93 cases the supravaginal wound was covered by peritoneum, with a mortality of 18 per cent. Of the 81 cases with the supravaginal wound open, 45 were treated with a drain, with a mortality of 24 per cent.; 36 were treated without a drain, with a mortality of 22 per cent. Of the 48 in which the edges of the supravaginal wound were brought together, 44 were treated with the drain, with a mortality of 25 per cent.; 4 were treated without the drain; and of the 4, 2 died. Of the 93 in which the supravaginal wound was covered by peritoneum, 57 were treated with the drain, with a mortality of 21 per cent., and 36 without the drain, with a mortality of 14 per cent.

TABLE III.

CLOSED PERITONEAL WOUND.

Supravaginal wound open.

With drain.

	No.	Died.	Rec.
Billroth, 1879–80,	7	3	4
Bompiani, 1881,	1	1	0
Breisky, 1882,	1	0	1
Dudon, 1883,	2	1	1
Fenger, 1881,	1	0	1
Gardner, 1884,	1	1	0
Howitz, 1882–83,	2	0	2
Mandillon, 1883,	1	0	1
Paggi, 1882,	1	0	1
Schede, 1880,	2	2	0
Solovieff, 1883,	1	0	1
Total,	20	8	12
Mortality,	40 per cent.		

Without drain.

	No.	Died.	Rec.
Brendel, 1882,	1	0	1
Bull, 1883,	2	1	1
Teuffel, 1880–81,	5	3	2
Total,	8	4	4
Mortality,	50 per cent.		

Supravaginal wound closed.

With drain.

	No.	Died.	Rec.
Czerny, 1878–81,	8	3	5
Mundé, 1883,	1	0	1
Staude, 1880–85,	16	0	16
Tauffer, 1881–84,	5	1	4
Total,	30	4	26
Mortality,	13 per cent.		

Total supravaginal wound open and closed	58	16	42
Mortality	28 per cent.		

PERITONEAL WOUND OPEN.

Supravaginal wound open.

With drain.

	No.	Died.	Rec.
Bauer, 1881	4	2	2
Billroth, 1880	3	1	2
Johannovsky, 1883	1	0	1
Olshausen, 1881–84	32	7	25
Pawlik, 1880	1	0	1
Purcell, 1884	1	0	1
Terrier, 1884	2	1	1
Tillaux, 1884	1	0	1
Total	45	11	34
Mortality	24 per cent.		

Without drain.

	No.	Died.	Rec.
Bernays, 1884	3	0	3
Billroth, 1880	2	0	2
Caselli, 1882	1	1	0
Cushing, 1881	1	0	1
Demons, 1882–84	7	3	4
Engström, 1884	2	1	1
Hahn, 1881–82	5	1	4
Kocher, 1881	1	0	1
Müller, P., 1884	4	0	4
Sänger (L.)	1	0	1
Starck, 1881	1	0	1
Thiersch, 1883,	4	1	3
Weir, 1885	1	0	1
Zweifel, 1882–84	3	1	2
Total	36	8	28
Mortality	22 per cent.		

Total	81	19	62
Mortality	23 per cent.		

Supravaginal wound closed. Edges brought together.

With drain.

	No.	Died.	Rec.
Bottini, 1881–85	5	0	5
Mundé, 1883–84	2	2	0
Schröder, 1880–84	34	9	25
Solowiew, 1883	1	0	1
Veit, J., 1883	2	0	2
Total	44	11	33
Mortality	25 per cent.		

Without drain.

	No.	Died.	Rec
Goodell, 1884	1	1	0
Wallace, 1884	3	1	2
Total	4	2	2
Mortality	50 per cent.		

Total	48	13	35
Mortality	27 per cent.		

Supravaginal wound closed. Peritoneum sewed to vaginal wall.

With drain.

	No.	Died.	Rec.
Dührssen, 1883–85	4	0	4
Foreman, 1884	1	0	1
Martin, to 1882	31	8	23
1882–84	21	4	17
Total	57	12	45
Mortality	21 per cent.		

Without drain.

	No.	Died.	Rec.
Fritsch, 1883–85	24	2	22
V. Herff, 1885	1	0	1
Schatz, 1881–83	10	3	7
Sänger (L.), 1883	1	0	1
Total	36	5	31
Mortality	14 per cent.		

Total	93	17	76
Mortality	18 per cent.		
Total supravaginal wound closed	141	30	111
Mortality	21 per cent.		
Total, supravaginal wound open and closed	222	49	173
Mortality	22 per cent.		

While the good results of Tauffer and of Staude show that complete closure of the peritoneal wound is no obstacle to the success of this operation, Table III. also shows that it is not essential to this success. Apparently complete closure of the peritoneum requires especial precautions or especial skill, as a high mortality has generally occurred where it has been attempted.

The treatment of the supravaginal wound is also a matter of importance. When the peritoneal cavity has been left open, the best results have been obtained where the peritoneum has been united to the mucous membrane of the vagina, closing the supravaginal wound. The leaving the supravaginal wound open, with a drain or without a drain, and the uniting the supravaginal wound around a drain, all show results up to the general average, while the complete closure of the supravaginal wound by approximating its edges without drainage, has had bad results, whether the peritoneal cavity were left open or closed. In general terms, therefore, we should either leave the supravaginal wound fully open, drain the supravaginal wound, or completely seal it by covering it with peritoneum, the weightiest evidence being at present in favor of the latter method.

The previous treatment of the diseased part, the protection of the peritoneal cavity during the operation, and the subsequent use of iodoform, are now matter of routine, the omission of which would be culpable.

The permanent tampon of iodoformized gauze recommends itself as furnishing a disinfecting atmosphere, together with that great gift of antiseptic surgery, namely, rest in the treatment of its wounds.

TABLE IV.

TABLE OF RECURRENCE.

	Well at the end of about 1 year.	Well at the end of about 2 years.
Bernays (Chip), May 15, 1885	1	1
Demons, Bull. et Mém. de la Soc. de Chir. de Paris	1	1
Dudon (Terrier), Bull. et Mém. de la Soc. Chir., 1885, x. n. 32	1	1
Düvelius, Deutsch. med. Wochen., Feb. 26, 1885	1	1
Martin, Path. u. Ther der Frauenkheiten, 1885, p. 303	8	8
Novaro, Abst. Br. Gyn. Journ, April, 1885	3	..
Olshausen, Beiträge zur Gyn., 1884, p. 107	7	4
Schatz, Arch. f. Gyn., 1883, xxi. 409	1	1
Staude, Deutsch. med. Wochen., 1883, p. 659	1	...
Tauffer, Arch. f. Gyn., 1884, xxiii. p. 367	2	...
Teuffel, v., Arch. f. Gyn., xix. p. 106	1	...
Trélat, Gaz. des Hôp., July 23, 1885	1	...
Zweifel, Centralblatt f. Gyn., June 28, 1884	1	1
Total	29	18

QUESTION OF RECURRENCE.—From Table IV. of this paper it is seen that 18 cases which have survived the operation have been well at a period varying between eighteen months and two years after. As the reports from which this table was drawn were not made later than the last of 1884 or the beginning of 1885, it is apparent that the cases referred to were operated upon previous to the end of 1882. Referring to Table II., we find that approximately 137 cases were operated upon during that period, and of this number, 97 survived the operation. Of

this 97, therefore, 18, or 20 per cent., were well at the end of eighteen months or two years.

Finding that recurrence is most general within the first year of the operation, cases which remain well at the end of eighteen months or two years are commonly considered cured.

Statistics of cures are, I find, made upon three plans: First, the number in whom recurrence is known are subtracted from the whole number of survivors, and the remainder are counted as cured, and the percentage is computed upon the number of survivors of the operation; second, the number absolutely known to be well only are counted as cured, but the percentage of such cures is estimated only upon the number of survivors whose histories have been followed; and, third, the number known to be well only are counted as cured, and the percentage is estimated upon the whole number who have survived the operation.

It is apparent that great discrepancies in reports can be accounted for by the method in which they have been made out.

In these tables the percentage of cures represents cases known to be well, and is estimated upon the whole number who survived the operation. The percentage of cures would probably have been higher could the number of cures among cases which passed from under observation also have been estimated. Hofmeier remarks that where patients have not reported they have usually remained well.

From Table IV. it appears that one out of five patients who survived the operation has remained well. Schröder and Olshausen obtain a cure in one out of three cases which survive the operation, and Martin, in one out of two cases, a result which is as good, if not better, than that of other operations for malignant disease (see Table V.).

Table V.

THE TOTAL NUMBER CURED COMPARED WITH THE RESULTS OF SINGLE OPERATORS, OF OTHER METHODS OF OPERATION, AND OF OTHER OPERATIONS FOR MALIGNANT DISEASE.

	Cases utilized.	Survived operation.	Per cent. of the survivors who remained well.
Kolpohysterectomy	137	97	20
" (Schröder[1])	12	9	33
" (Olshausen[2])	23	16	44
" (Martin[3])	19	16	50
Vaginal and supravaginal amputation (Schröder[1])	52	47	32
Galvanocautery amputation (Pawlik[4])	136	126	21
Amputation with hot iron (Schröder[1])	13	12	42
Extirpation of the breast (Volkmann's klinik[1])	131	121	15
" " (Rose's klinik[1])	...	...	15
" " (Billroth's klinik[1])	...	...	14
Total extirpations for cancer (Billroth's klinik[1])	448	...	23
Extirpation of the tongue, pharynx, and rectum (Kocher[1])	25	...	26
Extirpation of the tongue (Billroth's klinik[1])	...	...	17
Extirpation of the rectum (Rose's klinik[1])	...	...	12.4
Kidney extirpation for neoplasms[5]	33	13	...

[1] Hofmeier, Zeitschr. f. Geb. u. Gyn., 1884, p. 285. [2] Olshausen, Beiträge zur Gyn., 1884, p. 107.
[3] Martin, Path. u. Ther. der Frauenkheiten, 1885, p. 303.
[4] Pawlik, Wien. klinik, 1882, p. 425.
[5] Billroth, Wien. med. Wochen., 1884, n. 25, p. 774.

Opinions Regarding the Operation.—In Germany, in 1882, Rokitansky's was almost the only dissenting voice. At the present time the operation of kolpohysterectomy for cancer has been, within limits, accepted as a legitimate procedure.

In France, Pollaillon, in 1882, considered extirpation of the uterus an ill-advised operation, quoting West's statistics and the statistics of Freund's operation. In 1885, Pollaillon still prefers amputation, stating that in cancer of the cervix the disease does not early spread to the body, while in cancer of the body the diagnosis is uncertain.

Desprès and Championnière think that permanent cure of cancer of the uterus is impossible, that where the patient has remained well after the operation an error in diagnosis was made.

Demons, on the contrary, in 1883, said that total extirpation of the uterus by the vagina merited a better reception than had been accorded to it in France. It was practised upon subjects already condemned to a fatal issue, with the probability of a more or less prolonged accession of health, and with the possibility of a permanent cure. Demons states that the most usual time for the return is four or five months after the operation, with death at the end of twelve or fourteen months. Return may be in the cicatrix, but more often it is in the pelvic cellular tissue. He goes on to say that women suffer much less from the return than from the primitive growth, that hemorrhage is less frequent and less grave.[1]

Desoubroux, in speaking of extirpation of the kidney for cancer, says: "We must admit that there is a great probability of a return, yet we would operate, because, not to do so, is condemnation to certain death, while in favor of the operation is the fact that for some time after it the patient is comparatively free from the disease."

Terrier places extirpation of the uterus for cancer upon the same plane as extirpation of the kidney for malignant disease. Without being assured against its return, he would operate, because ablation is the only possible curative procedure.

Sebileau remarks: "The operation should be performed because, without it, the patient is doomed to certain death and to a disgusting infirmity; while, if there be a return after the operation, there is less danger of accidents and a diminution of pain."

In England, Duncan favors the operation for carcinoma or sarcoma of the body and cervix. Doran is opposed to the operation on the ground that the disposition of the lymphatics of the uterus is such as to make a radical extirpation of the disease impossible. Playfair thinks the operation of doubtful benefit, as the diagnosis of cancer is necessarily too late for complete removal. Purcell remarks that we should expect no more from extirpation of the uterus than from extirpation of the tongue

[1] Rev. de Chir., 1884, iv. 633.

or rectum for cancer, or from amputation of the breast. Sir Spencer Wells also thinks that we may yet learn much in regard to the technique of the operation, and that it ought not to be condemned.

In the United States, Polk considers the operation applicable only to primary cancer of the body. Where the body has been affected by extension from the cervix, he considers that the glands would have become already involved and thorough extirpation impossible.

Dr. Reeves Jackson, at the American Gynecological Association meeting in 1883, and again in 1885, strongly opposed the operation on account of its immediate mortality, and on account of the probable recurrence of the disease. Dr. Jackson's objections to the mortality list are based not upon the published reports, but upon a number of cases which he knows to have been unreported, and upon a further number of hypothetical unreported cases.

Mundé considers the operation justified in all cases of cancer of the uterus where the uterus is movable and the parametria uninvolved.

Bernays considers that the extirpation of the uterus for cancer will, in the near future, yield results equal to those of extirpation for cancer of the breast.

In general terms, while the advocates of this operation have abandoned the extravagant expectations of former years, they still anticipate of extirpation of the uterus for cancer as good results as those obtained upon other organs, by operations for malignant disease.

INDICATIONS FOR THE OPERATION.—There is general agreement that operation need not be attempted where the uterus is fixed, where neighboring organs are affected, or where enlarged glands can be found. Of 812 cases of cancer seen by Schröder, he found operation indicated in but 160, and total extirpation in but 34 cases. During the last four and a half years Wallace has seen 71 cases, of which but 6 were operable. Bernays has during the last year seen 16 cases, of which only 2 were suitable for operation.

Schröder does this operation only where the body and cervix are affected, doing supravaginal amputation by the vagina where the disease implicates only the cervix, and supravaginal amputation by laparotomy where the body only is affected.

Müller considers total extirpation indicated under each of the three circumstances, the greater mutilation of total extirpation, and the possibility of successful pregnancy in the remnant of the uterine body left by Schröder, being denied.

Ruge and Veit[1] find that cancer of the body tends to spread to the peritoneum, and only appears very late as secondary nodules in the cervix. Cancer of the portio vaginalis tends to spread to the vagina and the lower part of the parametrial tissue, while cancer of the cervix

[1] Zeitschr. f. Geb. u. Gyn., 1882, vii. p. 217.

spreads rapidly on the mucous surface, and early infiltrates the surrounding cellular tissue. Logically, they conclude that supravaginal amputation is indicated in cancer of the body and in cancer of the vaginal portion, in the former by laparotomy, and in the latter by the vagina, reserving total extirpation only for cancer of the cervix, when they say the involvement is too extensive to be otherwise removed, adding, however, that should the mortality of total extirpation diminish, so as to be less than that of partial extirpation, it would be, of course, indicated in preference to partial extirpation in all varieties of uterine cancer.

RÉSUMÉ.—1. The results of kolpohysterectomy for cancer have progressively improved with increase of the number of operations.

2. The total number of operations done up to the present time is approximately 341, with a total mortality of 27 per cent. 222 cases were treated with the open peritoneal wound, with a mortality of 22 per cent. Of the 222, 93 had the supravaginal wound covered by peritoneum, with a mortality of 18 per cent.; and of the 93, 50 were operated upon during the past three years, with a mortality of 10 per cent.

3. Of 97 cases which survived operations done previous to 1883, 18, or 20 per cent., are known to have been well at the end of eighteen months or two years.

4. The latest results of kolpohysterectomy for cancer contrast not unfavorably with those of the total extirpation of other organs for malignant disease.

5. The tendency of medical literature is to regard kolpohysterectomy for cancer as a legitimate operation, subject only to the restrictions common to other extirpations for malignant disease.

In concluding, I desire to express my indebtedness to the New York Hospital Society and to the New York Academy of Medicine, for the use of their libraries in the preparation of this paper; also to Dr. P. F. Mundé, who kindly placed his library at my disposal.

PRIMARY SARCOMA OF THE RIGHT KIDNEY.[1]

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INDEPENDENTLY of its rarity, the following case possesses some features of interest which appear to be deserving of record:

John D., aged fifty-three years, a brass finisher, was admitted under my care into Sir Patrick Dun's Hospital, October 25, 1884.

[1] Read before the Medical Section of the Academy of Medicine in Ireland, 1885.

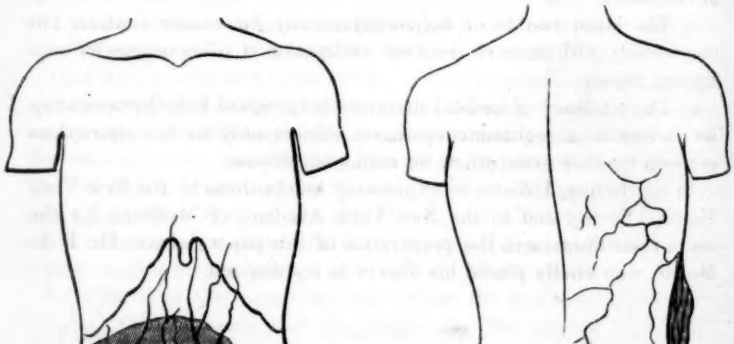
His family history was good, and he was not aware of any of his relatives having had "tumour." He escaped syphilis, and had never previously been seriously ill, although up to two years ago he was of intemperate habits, and drank freely of porter. He never suffered from jaundice, but twenty years ago a doctor told him that his liver was getting hard from drink. To the best of his belief he was in perfect health up to about two years ago, when, shortly after his return from America, he perceived a slight pain in the right side below the ribs. This gradually became worse, and some months later he noticed a swelling in the right side. Still he was able to persevere in his employment, which was somewhat laborious, but a month before admission his appetite failed and he gave up work. When in good health he weighed eleven stone, and, although he cannot fix his present weight, is certain that he has lost much flesh, especially within the last six weeks.

Some seven or eight years ago he states that he passed bloody(?) urine, attended with some pain and difficulty. Nothing of the kind recurred until seven or eight months ago, when, without apparent cause, he passed, with pain and difficulty, a "very dark fluid" from the urethra.

The man's aspect is haggard and worn, and he is in low spirits about himself. Physical examination yielded the following results:

Thorax.—Heart's sounds normal, rather feeble. Pulse 72. Respiratory sounds quite healthy: complains of some pain between the shoulders.

FIG. 1. FIG. 2.



Appearance of the cutaneous surface.

Abdomen.—Skin white, and, on either side, especially the right, is a network of enlarged veins stretching up to the axilla, and also visible posteriorly. There was no evidence of fluid in the abdomen, but a large

swelling projected on the right side, extending from the ribs to within two inches of the ilium, and laterally about two inches to the left of the umbilicus.

The tumor was firm in consistence, with a well-defined and rounded edge, and the swelling could be felt behind in the lumbar region, but could not be moved from side to side, nor did it follow the motions of the diaphragm.

That the tumor was not connected with the liver was shown by the ease with which the fingers could be pressed into the groove which existed between it and the ribs. No pulsation nor sound could be detected, and after repeated examinations it was impossible to make out any zone of clearness in front.

The tumor, which was diagnosticated as a malignant renal swelling, was uniformly dull to percussion, and it was concluded that no portion of the intestine lay in front of the tumor, this striking exception to the general rule being surmised to be due to the intestine having contracted adhesion to the lower edge of the tumor in an early stage of its growth.

The hepatic dulness was not markedly increased upward, and there was no enlargement of the inguinal or other glands. The testes were unaffected.[1]

His appetite was fairly good; he had vomited frequently before admission, but only once since. The bowels were very costive, and the skin dry.

Neither at the time of his admission nor at any subsequent time was there the least appearance of œdema of the legs or feet. Pain was seldom complained of during his stay in hospital, and the tumor could always be freely handled without causing him distress.

The urine presented some characters of interest. It was usually bright and clear, very acid, sp. gr. about 1.012. It frequently deposited stringy and flaky masses, and the microscope showed numerous mucous corpuscles, and crystals of oxalate of calcium, and sometimes transparent tube-casts, of fair size, and occasionally spiral in form.

Albumen was constantly present in considerable quantity, to about one-sixth. When the clear urine was acidified with a few drops of acetic acid (or solution of tartaric acid, etc.) no immediate change occurred, but after a few seconds cloudy streaks appeared, and the opalescence gradually increased and spread through the fluid until the whole became semiopaque. This opalescence was not cleared away by a gentle heat, and was readily produced even when the urine was previously diluted to two or three volumes. It may be inferred, therefore, that the opalescence was due to the precipitation of a body of the mucin class. When the urine was simply diluted to three or four times its bulk, and allowed to stand, it became milky (globulin?).

No color change with ferric chloride. Tested for indigo substances with strong hydrochloric acid and chloride of lime, it became opaque and of a deep slate-violet color. Floated on cold hydrochloric acid, the latter assumed a violet color which was extracted by chloroform. Boiled with hydrochloric acid it became dark red. It has been already mentioned that the urine was liable to contain flaky shreds, but on December 13th, after slight difficulty in micturition and momentary obstruction,

[1] Niemeyer calls attention to the frequency with which cancer of the kidney is complicated with cancer of the testis, reminding us of the still more common coincidence of tuberculosis of these organs.

he passed a curious looking mass *per urethram*. It consisted of a filiform piece about three inches in length, terminating in a cluster of sacciform tassels. It was mostly white, but in part reddish; and was very elastic. On subsequent occasions he passed numerous other bodies of the same general character, which I preserved in spirit, but during the last few weeks of his life none were seen.

Toward the end of December the tumor had enlarged in every direction, become more prominent in front, and the cutaneous veins more distinct, especially posteriorly. Beyond the latter sign, however, there was no evidence of interference with the abdominal circulation, and the emaciated limbs were quite free from œdema. The bowels did not move except by enema; but, strangely enough, this obstinate constipation yielded after a time, and toward the end of his life the bowels acted naturally.

During the months of January, February, and March, his general condition changed but little, except that he gradually wasted to an extreme degree, his appetite slowly failed, his strength ebbed away, and he died quietly at 10 P. M., on April 14th.

The *post-mortem* examination was made twelve hours after death.

Scarcely a trace of subcutaneous fat was visible. Upon opening the abdomen, not more than an ounce or two of fluid was seen lying in the pelvis, and there were no traces of peritonitis, except a few old fleecy adhesions. Before the position of the viscera was disturbed, it was observed that *no part of the intestines lay in front* of the tumor. The colon was closely adherent to its lower edge. The liver was not displaced or twisted on its axis, an occurrence which has been often observed in other cases of renal tumor on the right side. A large vein crossed the tumor toward the left side, passing from beneath the liver to the great omentum, and a close network of veins was visible on and beneath the loose fibrous capsule which covered the tumor. In some places these veins were continuous with those of the abdominal walls. The hemorrhoidal veins were engorged. The vena cava as it passed under the liver was distended by a large laminated thrombus terminating superiorly in a blunt cone. The right renal vein was likewise occupied by a soft thrombus; the left renal vein was small and free from clot. The large intestine was contracted; the small intestines grayish colored. Mesenteric glands dark, nearly black, and very slightly enlarged.

The spleen was swollen and very soft on section. No infarcts. Liver increased in size, firm, and yielded amyloid reaction with iodine. Anterior surface of its capsule marked with fibrous reticulations.

Left kidney amyloid, scarcely enlarged. Double ureter on left side. There was no calculus in either kidney.

Bladder healthy; contained a soft quadrangular mass similar to what had been passed with the urine during life.

The thoracic viscera exhibited nothing noteworthy, with one exception. The heart was very small, the lungs were free from any secondary disease, but behind the trachea and between the bronchi was a group of lymphatic glands, enlarged, matted together, and infiltrated with white masses resembling malignant deposits. Subsequent microscopical examination showed that the gland tissue was simply in a state of caseous degeneration. Hence it may be said that there was no metastasis or secondary involvement of distant parts.

Right kidney was entirely converted into a mass of new growth. It

weighed nearly four pounds. The tumor was enveloped in a sort of loose capsule of connective tissue, but was readily separated from adjacent parts. The vertebræ were not eroded.

The ureter was pervious, not dilated. The pelvis of the kidney was occupied by a firm fibrinous plug, which fitted closely and tapered down into the ureter. It was white or yellowish, elastic, and exactly resembled in appearance the clots passed *per urethram*, and when hardened and examined microscopically possessed the characters of a blood-clot.

The right suprarenal capsule was loosely attached to the summit of the tumor, and upon section exhibited a nodule or two of whitish, cheesy material. The renal tumor was divided in its length, and the cut sur-

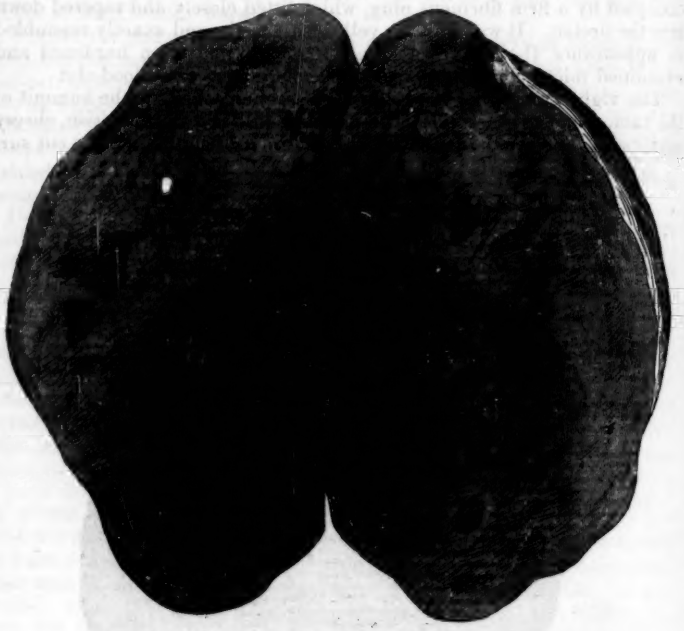
FIG. 3.

Appearance of right kidney.

faces presented a mottled appearance, traversed by intersecting bands of firm fibrous tissue, forming imperfect loculi. The greater part was of a yellowish-white color, but parts were red and stained with blood, and here and there, areas of a yellow gelatinous deposit were to be seen. Portions of the tumor were hardened for microscopical examination, and I am indebted to my friend, Dr. Henry Bewley, for mounting some slides.

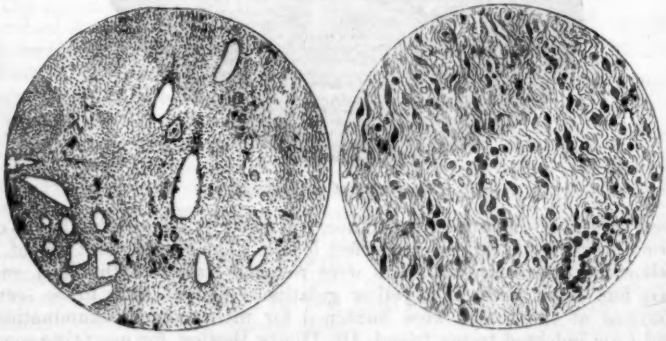
The tumor proved to be a spindle-celled sarcoma, and the appearances are fairly exhibited in the accompanying drawings.

FIG. 4.



Appearance of right kidney after incision.

FIG. 5.



Low power. High power.

Microscopic sections of tumor.

Good illustrations of the macroscopic characters of malignant disease of the kidney are to be found in Rayer, *Traité des Maladies des Reins*, 1837, Pl. xlv. Fig. 1; Pl. xlvi. Fig. 1; and in Pl. xlvii., which depicts a thrombus in the vena cava, as in my case. Cruveilhier, *Anatomie Pathologique*, 1829, 18e Livr., Pl. 4, left kidney; 18e Livr., Pl. 1, right kidney and adrenal.

The foregoing case suggests a few remarks, and, for convenience, I shall arrange them in separate paragraphs.

1. *Rarity.* Malignant disease of the kidney appears to be of rare occurrence. In Ireland only one or two cases are alluded to in the *Transactions of the Pathological Society of Dublin*, and comparatively few are published in the *Transactions of the Pathological Society of London.* In 1877, I exhibited before the Pathological Society a specimen of a large sarcomatous tumor of the left adrenal, removed from an elderly male subject in the dissecting-room. The left kidney and all the other abdominal viscera were normal in structure.

In the Children's Hospital at Prague, Steiner observed but four cases of renal cancer among 100,000 children, although, as is well known, a notable proportion of the cases occur within the first decade of life.

2. *Diagnosis.* In my case little difficulty attended the diagnosis as to the existence of a renal tumor, the shape of which bore out Sir W. Jenner's dictum, that a diseased kidney preserves its rounded form and never acquires a sharp edge. (For a series of instructive outline diagrams of abdominal aspects of renal tumors, cf. Dickinson, *Renal and Urinary Affections*, III., 1885, p. 710.)

But it is well known that the diagnosis is not always so facile, and competent authorities lay down that swellings of the kidney are perhaps more often the subject of errors of diagnosis than those of any other abdominal organ. Two points in especial are deserving of comment in the above case:

(*a*) The absence of intestine in *front* of the tumor. Great stress is laid, and properly, upon the diagnostic value of the clinical fact that the colon almost invariably lies in front of a renal swelling, and Dickinson remarks that the exceptions are so rare that they have the interest of *lusus naturæ*. A case of Dr. Bridges is quoted by Dickinson (p. 717), in which a malignant tumor of large size of the right kidney grew in such a way that it entirely excluded the colon from any contact with the front of the tumor. The exceptions, when they occur, are more likely to be met with on the *right* side, because the colon on the right side is not so closely connected with the kidney as on the left. The colon is attached to the posterior abdominal wall higher and more extensively on the left side than on the right (cf. Landau on *Movable Kidney in Women*, New Syd. Soc., 1884). The bowel is never found in front of an enlarged spleen, and suprarenal tumors are not necessarily crossed by bowel.

(*b*) The numerous fibrinous clots which were passed at intervals for some weeks. These were mostly elongated and decolorized, and some vermiform in shape, evidently moulded in the ureter. According to Dickinson, ureteric casts are infrequent.

It may seem strange that, while these fibrinous clots were repeatedly passing out with the urine, yet no trace of blood was discovered in the urine on more than one occasion when it was looked for. The explanation appears to be this: The conical fibrinous coagulum which plugged the pelvis of the kidney and mouth of the ureter being slowly urged on from behind by the pressure of the increasing new growth, and by accretion of the clot posteriorly, bits of the plug were from time to time broken off, and so found their way to the bladder. The plug, like a tight valve, fitted the orifice of the ureter so closely, that nothing could escape past it, and hence the absence of hæmaturia. The non-occurrence, however, of hæmaturia does not count much one way or the other in a diagnostic point of view; for, taking Roberts's, Ebstein's, and Dickinson's statistics, we arrive at the conclusion that, roughly speaking, hæmaturia occurs in scarcely half the cases of malignant renal disease.

It might be asked why did not the kidney dilate, or at least cysts form, if the ureter were completely obstructed, and the reason probably was that, owing to the total destruction of the glandular renal tissue by the invading new growth, no secretion of urine occurred, the left kidney doing the entire work. Judging from the cases on record, it seems to be the exception to find the whole of the kidney tissue replaced by the neoplasm.

3. *Character of the urine.* (*a*) Albuminuria. This was persistent throughout, and varied little in amount. During the patient's lifetime it was inferred, and correctly, that this symptom betokened disease, probably non-cancerous, of the left kidney, which, it will be remembered, was afterward found to be affected with amyloid degeneration. The coincidence of malignant disease on one side, and amyloid degeneration of the other kidney, is noted by Ebstein as of very rare occurrence.

(*b*) The persistent excretion of a mucin-like substance. The urine, clear and free from viscidity, upon acidification with any acid, invariably yielded a turbidity, which gradually developed and increased in degree, and was not cleared away by cautiously warming.

4. The *absence of either ascites or œdema* of the legs is noteworthy when we consider the size, position, and weight of the tumor, and the fact of the thrombus in the vena cava, not to speak of the coexistence of amyloid disease in the other kidney.

5. *Feasibility of operation.* Metastatic deposits are stated to have occurred in seventeen out of forty-one cases collected by Dr. Bertram Windle,[1] and in the light of the post-mortem evidence I regret that the

[1] Primary Sarcoma of the Kidney, Journal of Anatomy and Physiology, vol. xviii.

question of surgical interference was not more seriously entertained during the patient's lifetime. From the autopsy it appeared that, considering the nature and attachments of the tumor, the chance of a successful result from operation would not have been inconsiderable. A successful use of nephrectomy for round-cell sarcoma of the right kidney in a boy aged three is reported by Mr. Croft, in the *Lancet* for May 23, 1885; and in the same journal for August 15, 1885, is an unsuccessful case of operation by Mr. Whitehead for sarcoma of the right kidney in a man aged forty-six years. Death from peritonitis ensued on the fourth day. A list of cases in which the operation has been performed is given by Mr. Baker in *Trans. Med.-Chir. Society*, vols. 63 and 64.

6. *Histological nature.* It is curious to note the vagueness and diversity of statement among recent authors upon this point. Thus Roberts (*Urinary and Renal Diseases*, 4th ed., 1885, p. 575): "The species of cancer found in the kidney is almost invariably the encephaloid (fungus hematodes), and scirrhus is very rare in the kidney." Ebstein refers the majority of cases to scirrhous carcinoma; and Wilks and Moxon (1875) state that "carcinoma is the kind of cancer most commonly present in the kidney." They do not allude to sarcoma.

The fact is that scirrhus, though often spoken of, is rare as a renal growth. Malignant tumors of the kidney have been so generally described as cancer that Dickinson (loc. cit.) was much surprised to find, upon examining a number of specimens, that cancer, as structurally defined, was comparatively rare among them. "By far the larger number of malignant renal growths fall within the definition of sarcoma;" and Windle (loc. cit.) remarks that the "definitiveness of sarcoma of the kidney has only been recently recognized."

Of eight tumors catalogued as cancer in the Museum of St. George's Hospital, two of which were specified as scirrhus, six proved to be not cancer, but sarcoma; the term "scirrhus" having been applied in each instance to a hard sarcomatous growth. A profusely cellular, highly malignant, round-celled sarcoma is the most common of all renal growths (Dickinson). But the spindle-celled variety of sarcoma is also known to occur, and the case I now record is a good example of this kind of growth.

SUCCESSFUL RESECTION OF INTESTINE IN A CASE OF STRANGULATED FEMORAL HERNIA.

By J. Clark Stewart, M.D.,
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Recorded operations of this character are sufficiently rare to justify reporting the following unusual case:

F. G., a Russian Jew, æt. 68, was admitted to Mount Sinai Hospital on May 4, 1885, suffering from a strangulated hernia, and, through the kindness of Drs. W. F. Fluhrer and D. M. Stimson, visiting surgeons, I was permitted to operate on the case.

The following history was obtained: The patient has had a femoral hernia, on the right side, for the past twenty years, always reducible, and easily controlled by a truss. Three days ago, in the morning, patient went to stool without his truss, and after forcing down hernia by straining, was unable to reduce it, and soon began to suffer great pain. During this and the next day several physicians repeatedly employed taxis without relief. Three enemata were also given, which brought away a small stool. After this the patient complained of more pain, and began to vomit, at first the contents of stomach, afterwards mucus and bile. These symptoms continued through yesterday, and this morning there are in addition hiccough, and some swelling of lower abdomen. Patient has eaten nothing since emesis began, and has become very dejected and stupid.

Previous history very good. No serious illness. No venereal trouble.

On admission: General condition of patient is fair, though he is weak. His pulse is slow, about 70, and intermits irregularly. There is marked atheroma of arteries. Tongue is coated and dry, countenance heavy and dull. Temperature 100.4°. Patient vomits intermittently a brown offensive fluid almost fecal in odor.

In right femoral region, just below Poupart's ligament, and extending upward under same, is a roundish tense tumor about two inches in diameter, having the spine of the pubes to inner side, and the femoral artery deep behind and to outer side. The skin over this tumor is reddened, œdematous, and apparently adherent. Pressure is very painful, resonance slightly tympanitic, no fluctuation, no impulse on coughing. Lower abdomen is enlarged and tympanitic, but not tender on pressure.

Operation at 8 P. M. Primary ether anæsthesia was used, prolonged by the use of morphine hypodermically. Carbolic acid solution was used for cleansing the skin, and for the instruments, and solutions of bichloride of mercury for irrigation.

An incision was made over the tumor, and the sac on being opened was

found to contain a small quantity of dirty brown serous fluid, mixed with fecal matter and flakes of fibrin. This was removed, and sac and wound thoroughly irrigated with 1 : 2000 bichloride solution. The stricture at the neck of the sac was then relieved by nicking with a knife, and stretching with the finger, and several inches of intestine pulled down and examined.

The strangulated portion was found to consist of a knuckle of gut about three inches long, on the convex surface of which was a diverticulum about one inch in diameter, having a small ragged opening at its extremity. The walls of this diverticulum were very thin, as the mucous membrane of the gut was here destroyed, leaving only peritoneum, and some dilated veins. The gut beyond the strangulation appeared healthy, though quite congested and œdematous, especially on the proximal side.

The gut was then seized with hæmostatic forceps on either side of the diseased portion, which was then excised, about four inches being removed, the corresponding mesentery having first been ligated in segments with strong catgut, about half an inch from its attachment. The tissue in the grasp of the forceps was also removed, and after ligating all bleeding vessels the two extremities of the gut were united with fine catgut, using Lembert's suture. The cut edges of mesentery were also sutured, leaving the ligated portion lying in a fold above. Especial attention was paid during this part of the operation to preventing the entrance of any fluid into the peritoneal cavity, and also to keeping the protruded gut warm.

All exposed parts were now freely irrigated with warm 1 : 3000 bichloride solution, and the gut was returned into abdomen without difficulty, The sac was then ligated at its neck and cut off, and the external wound sutured, after putting in a rubber drain. Wound was dressed with iodoform gauze over incision, covered with a thick pad of bichloride gauze. and bandaged firmly.

Only four ounces of ether and eight minims of Magendie's solution were used for the anæsthesia, the operation lasting two hours.

At 11.30 P. M. the patient showed no shock, and felt well. Does not vomit. Temperature 98°; pulse 72; respiration 16. Was given cracked ice and Seltzer water during the night.

5th. Twelve hours later. Patient feels quite comfortable; he has not vomited since operation; has passed flatus per anum in large amount. Took three cups of milk and a moderate quantity of ice and Seltzer during the day; also had gr. iij ext. opii per rectum. Temperature 8 A. M., 100.4°; 5 P. M., 102°; 11 P. M., 101.2°; pulse 84–87; respiration 16 to 18.

6th. Patient is comfortable, and only complains of pain in external wound. Temperature remained about 100° all day. Food the same as yesterday, with the addition of whiskey and sarco-peptones.

8th. No change. Patient feels too well for his own good, as he wishes to get up. Fearing that his restlessness might have disarranged dressing, it was changed. Wound appeared healthy, and there was superficial union.

9th. Patient was very restless last night, and, during the absence of the orderly he got out of bed, and attempted to have a stool. This morning, in spite of opium, he accomplished his end, and passed without pain a large soft stool, containing no blood.

10th. Had two formed stools during the day. Otherwise about the same.

11th. Wound was dressed, and found entirely healed, except the opening for drainage.

14th. Had two stools to-day, without pain. He coughs a little, and a few coarse râles can be heard over left lower lobe. Since the 8th instant patient has been growing delirious, and is very restless, especially at night. He constantly tries to leave his bed and go to the closet, and at times must be tied to keep him in bed. Anodynes have been thoroughly tried, but with little effect, and the excitement and physical exertion have weakened him greatly, so that it has become necessary to increase his food and stimulants.

From this time on, the patient gave us all a great deal of trouble. Besides his delirium, his lungs, kidneys, and heart gave us at different times cause for anxiety. At one time he utterly refused to eat, and for several days was nourished by enemata of pancreatized milk. As soon as possible he was got out of bed and made to take a little exercise, and after this steadily improved.

During the week ending May 30th he had daily stools, was about, ate and slept well, but his mind still wandered. He failed to recognize his friends, and had many hallucinations.

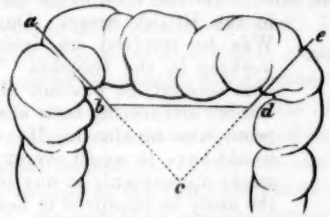
On June 5th, one month after the operation, he was discharged well in body, though not in mind, but ten days later returned on a visit sane.

Sept. 30. He was well. Has had no trouble with hernia since operation. No constipation.

I was much interested in reading at this time a report, by Mr. Mitchell Banks, in the *Lancet* of April 25th, of a somewhat similar operation, but I was able to gain little aid in the treatment of my case, as that used by him would have inevitably killed my old Russian. Four days of ice diet, eight days more on ice and small amounts of beef-juice, with confinement of the bowels till the twenty-third day, contrast strongly with the large amounts of liquid food and stimulants required to keep alive a feeble old man. The moving of the bowels on the fifth day, and so frequently afterwards, was not intentional, but non-preventable, owing to the negative effect of opium in any form or dose on his bowels.

The only peculiar feature of the operation itself was the non-excising

of the V-shaped piece of mesentery usually recommended. This was to avoid the chance of cutting off any blood-supply to the remaining gut, which is mentioned by Treves as one of the dangers of the V-incision.



a c e, Usual section. *a b d e*, Actual section.

However, if more gut had been excised, I should have been obliged to use the V, as a greater bulk of mesentery would have been difficult to reduce.

As to the propriety of resecting the gut in this case, instead of opening and leaving it *in situ*, as is generally advised, I may say that my hospital experience of the latter measure had been so discouraging as to make any alternative preferable. Out of twenty herniotomies during my service, two showed gangrenous gut, which was opened and left *in situ*, both patients dying early from septicæmia, and in one of these cases, a well-conditioned male, the impression was strong on every one connected with the case, that resection of the gut would have given him a better chance.

I think that most readers will agree with me that the resection of gangrenous intestine in strangulated hernia is not such a forlorn hope as it is usually represented to be, when an old man, too stupid to understand his danger or his chances, and in bad condition physically and mentally, recovers after such an operation performed with the hospital house-staff as operator, assistants, and advisors.

MINNEAPOLIS, MINN., October 24, 1885.

A CASE OF DISSECTING ANEURISM OF THE THORACIC AND ABDOMINAL AORTA.[1]

BY JAMES E. GRAHAM, M.D.,

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THROUGH the kindness of Dr. Richardson, of Toronto, I am enabled to describe this very interesting and rare specimen. Dr. Richardson has

[1] Read before the Canada Medical Association.

made the dissection in such a way as to show the principal points of interest.

The patient from whom the specimen was taken was a prisoner in the ... jail, and died there. He had been in his earlier days a soldier in the British army. During the Crimean War he received an internal injury while working in the trenches. According to his own account, he was not able to work afterwards; and having been examined by the surgeon, was invalided. He was told that he would have to avoid overexertion, and that he might die suddenly at any time. After he left the army he improved in health, and has since been able to earn his living, although he has not been strong. He was known to Dr. Richardson for some years as an occasional inmate of the jail. He complained of pain in the chest on left side, and the diagnosis of aneurism was made during life.

A. Aorta.
B, Dissecting aneurism.
C, C, Lumbar branches.

A few days before his death he suffered from pulmonary hemorrhage of severe character. A second attack proved fatal.

The *post-mortem* examination revealed the following condition: The ascending and transverse portions of the arch of the aorta were very much distended, the result, no doubt, of the partial obstruction. Immediately beyond the exit of the left subclavian a saccular dilatation was found, which was intimately adherent to the lung. A rupture had taken place in the portion, and the blood found its exit through the bronchial tubes. In the distal portion of the sac there were two openings, one of which was continuous with the natural lumen of the aorta (A), and the other communicated with the dissecting aneurism (B). The latter was made by the blood finding its way through the middle coat of the vessel, and dissecting the intima and inner portion of the media from the outer portion of the media and the outer coat. This was continued almost completely around the vessel, and extended throughout the whole length of the thoracic and abdominal aorta. Toward the lower portion of the abdominal aorta there existed a large opening through which blood could pass from the dissecting aneurism back into the aorta proper. This opening was the natural outlet into the right renal artery, and remained after the outer had been torn away from the inner coat. Two or three smaller openings similar in character were found higher up. Some of the arteries open into the dissecting aneurism without any corresponding opening into the main artery. The openings must have at one time existed and have gradually become closed up. At the line of junction between the aneurism and the arteries were found a number of cords, which were no doubt remains of the circular fibres of the middle coat, and had gradually become thickened. At the lower part the dissecting aneurism ended in

a *cul-de-sac* just above the bifurcation. The two orifices c c represent lumbar branches.

This case presents many points of very great interest.

(1) The length of time the patient lived after the first formation of the aneurism, a period of more than thirty years. Dissecting aneurisms are generally considered to be of a very fatal character. In this case the strain was taken off by the opening low down between the artery and the aneurism, which rendered it possible for the blood to flow readily back into its old channel. Erichsen speaks of such openings as the result of atheromatous disease; but in this case the openings were those which had already existed at the point of exit of the various arteries. I have not found the description of any case with such openings.

(2) The extent of the aneurism. It extends throughout the whole length of abdominal and thoracic aorta, and more than half the circumference of the vessel. It is not so unusual to find very extensive, diffuse dissecting aneurism, formed by the blood's finding its way between the outer coat and the sheath of the vessel.

(3) The closing of openings in the inner coat, at the exit of arteries from the aorta.

(4) The corrugated appearance of the inner surface of the aneurism.

In Holmes's *System of Surgery*, under the head of dissecting aneurism, reference is made to Dr. Peacock's contribution. He, Dr. Peacock, has shown that a layer of the middle coat is left exterior to the blood-current. This is clearly shown in this specimen.

A very interesting case has been reported by Dr. Swayne, of York, England, in which the diagnosis was made during life. He lived three months after the commencement of the process of dissection. Its extent was about the same as the one presented.

Erichsen divides dissecting aneurism into three classes: (1) In which the blood, after passing some distance through the substance of the middle coat, bursts through the outer coat. This is the most common form. (2) In which an opening takes place at the lower extremity between the aneurism and the main artery. (3) In which a sac forms between the inner and outer coats, and rupture through the outer finally takes place.

According to this classification, the case presented would belong to the second class, but is unique in the form of opening existing between the artery and the aneurism.

A very interesting case was reported by the late Dr. Hilton Fagge, which must have resembled this one very closely. In it the inner lining of the aneurism became so perfect that it could scarcely be distinguished from that of the aorta itself.

The case before us is an excellent example of the restorative power of nature, and demonstrates the possibility of the enjoyment of years of fairly good health in one suffering from an extensive dissecting aneurism.

NOTES TOWARD THE FORMATION OF CLINICAL GROUPS OF TUMORS.

By Jonathan Hutchinson, F.R.S.,
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The time has, I think, arrived when it is both possible and desirable to make, for practical purposes, a much more detailed classification of tumors than has yet been attempted. Some grouping of the kind I refer to is needed, both for purposes of prognosis, and in order that we may lay down good rules for treatment.

Such grouping must be accomplished chiefly by observation of external features of similarity, and of resemblance in general tendency. It is these conditions, rather than minute histological differences, which will be of chief assistance to the surgeon; or, perhaps, it may be convenient to have two classifications side by side, the one clinical, the other histological, and let the two help each other at all points where mutual help is possible. The surgeon cannot much longer content himself with the groupings which the microscopic pathologist offers him. During the past quarter of a century, he has perhaps waited more than was wise, and expected more than was possible. Not that I would for a moment speak disparagingly of the labors of histologists, or of the results which have accrued from them.

These labors have been vast and most meritorious, and the results splendid. Still, however, I return to my statement that the revelations of the microscope in reference to new growths are inadequate to the needs of the practitioner who has to deal with them, and that the latter will, in most instances, help himself better by setting to work at accurate and detailed clinical observation. The microscope has succeeded in establishing the fact that rodent ulcer is epithelial cancer, but meanwhile the ulcer in question keeps true to the first clinical descriptions given of it by Jacob, and Brodie, and is as different as possible from the more common forms of epithelial cancer as we see it in the lip, the tongue, and other parts. The disease to which the term rodent or Jacob's ulcer is, or was formerly, given, is not, however, by any means, the only very peculiar form of malignant growth which occurs on the face, with which surgical observers are familiar. There is another form of ulcer very different indeed from it, inasmuch as a rapidity of growth is as definitely its characteristic as slowness is of common rodent.

For this, also, so far as I know, pathologists have no other name than epithelial cancer, although it has distinctive features, both in its mode of growth and in its external appearance. This ulcer I have been in the habit of recognizing as "the crateriform ulcer," a name which denotes its peculiar appearance after ulceration has occurred. It shows

but little tendency to return after excision, and does not quickly affect the glands. It is clinically not in the least like rodent ulcer, nor any of the ordinary forms of epithelial cancer. I mention this disease now, just by way of example. In the malady to which Hebra gave the name of rhino-scleroma, we have, possibly, another good instance of the outstripping of the histologist by the practitioner. The latter declares, apparently upon good grounds, that the disease in question has very distinctive features, and the former admits that he can discover nothing in the least peculiar in its tissue structure. Whilst, then, we may accept the large, I had almost said unwieldy, groups constructed for us by the microscopic pathologist, his carcinomata, sarcomata, and epitheliomata, the task will yet remain for the surgical observer to bring this huge mass of material into something like orderly arrangement by careful observation among his patients.

It is not my intention, in the present paper, to attempt the ambitious task of presenting an arrangement of new growths based upon their clinical features and like histories. Such a task would find work for a lifetime. I am, however, so convinced both of its desirability and of its practicability in the future, that I shall be bold enough to venture a few hints and detached memoranda, which may possibly prove helpful toward its attainment at some future time. It would seem, in the first place, to be most desirable for us to take careful note of all rare and exceptional forms of new growth.

Every one who has engaged in original observation must have been struck with the fact that conditions of extreme rarity and of apparently almost unique peculiarities will be found, if our sphere of observation be but large enough, and our patience sufficient, to have their exact counterparts. Only wait, and we find ourselves able to parallel, and sometimes with extraordinary exactitude, conditions which, at first sight, had seemed not in the least likely to be repeated. Thus we become convinced of the fact that not only in common maladies, but in the rarest, the forces of production are acting in methods which insure uniformity of result. Examples of this occur in the most instructive manner in the instance of new growths. Good illustrations of it—that is, of the exact repetition of unusual peculiarities—may be witnessed in cases of melanosis attacking the nail-bed, of melanosis on the heel, of leucoma asperum, of the tongue, in the growths (epithelial) which occur in the late stages of Kaposi's disease, and very many others. I shall presently have to describe in detail some other good examples as witnessed in tumors of bone, multiple fibroid tumors, and the recurring round-celled sarcoma of skin. Thus, then, the plan should be to take any example of rare disease, and keep it by itself until others similar to it are found, and thus construct groups which, in turn, may become large enough to allow of our determining, without much risk of error, what are the differential peculiarities

of the malady. Instead of trying to merge rodent ulcer in epithelioma, keep it rigidly apart, and note also the differences from each other with various examples of rodent present, with the hope of determining whether there be not sub-groups well worth construction.

A general law may be noted for our guidance in clinical observation in this matter. It is, that we may expect exact repetitions of structural peculiarities whenever the morbid tendency displays its activity in precisely similar regions; rodent ulcer is again our easiest illustration of this, occurring, as is well known, almost solely in the face with such preponderance in one special region that it gained the name, when first recognized, of "peculiar ulcer of the eyelids."

Why should epidermic or epithelial cancerous action, when it displays itself on the upper part of the face, produce a sore having the peculiarities of rodent, whilst, if on the hand or foot, or even on the neck or chest, it would be attended by quite different ones. The sides of the nose, the eyelids, and the cheeks, are the appropriate territories for rodent ulcer. If the lips, any part of the ears, or any part of the neck be attacked, it is highly probable that the disease will at once deviate from the peculiarity of rodent and affect the lymphatic glands earlier.

I have long been familiar with a very peculiar tumor growth which affects the upper part of the neck. A lump resembling a potato forms quickly, but painlessly, under the upper part of the sterno-mastoid muscle. Probably it begins in the lymphatic glands; it is a single, hard, nodular mass. It bulges on both sides of the muscle, is very firm, and presents great bossy projections on its surface. The clinical course of this tumor is rapid growth, ulceration, a fungous mass, hemorrhage, and death within six or eight months of the beginning. It is, I believe, a lympho-sarcoma in histological language, but I know of no other regions of the body in which a precisely similar kind of tumor occurs. I have seen at least a dozen examples of it, and they are all very much alike. Its subjects are usually healthy men of middle age. They are always primary, always on one side only, and never cause growths elsewhere. They kill by the rapidity of their local growth.

The tendency to produce in the same part of the body exactly the same morbid conditions is impressively illustrated in two drawings which I possess, representing sections of the lower end of the femur after amputation. The two drawings are so exactly alike that it might be thought that they had been taken from the same specimen. They show the formation of a cystic myeloid sarcoma within the condyles, expanding them, and the lower part of the shaft. One of them was taken twenty-five years ago, from a young woman, whose thigh was amputated after several months of slow growth. Her case is published in the *Pathological Society's Transactions*, and also in my *Clinical Illustrations*. The other had an almost precisely similar history; the patient being a young

man, whose thigh I amputated in the London Hospital a few years ago. Both patients are, I believe, still alive; and the cases are, in all respects, close parallels.

I have no other drawing of myeloid in any other bone in the least resembling the conditions shown in these two, nor do I recollect ever to have seen a specimen or a patient whose history closely approached them.

The melanotic sarcoma, when beginning in the sole of the foot, runs a very peculiar course. Of this, again, I have two drawings, which might be mistaken for each other. The disease is usually under the middle of the tread of the heel. There is so little of pigmented growth that it is necessary to look most carefully to find any; but if you do look well, there will always be seen a few little streaks and patches in the skin at the edge of the ulcer which resemble lunar caustic stains, and are often mistaken for them. The disease consists in an ulcer from which a sprouting mass grows up, which consists of unpigmented sarcoma. In this disease the lymphatic glands are implicated with great certainty, and early, and the prognosis, however trivial the local disease may appear, is very bad. I have recently attended three patients with melanosis in this position, and they all ran exactly the same course.

A very interesting and peculiar group is constituted by the symmetrical fatty outgrowths formerly described by Sir Benjamin Brodie and others, to which Mr. Morrant Baker has recently given much attention. The microscope reports that they are chiefly fat, with some admixture of fibrous tissue, but they deserve a clinical designation, since they are wholly different in course and tendency from other examples of the fatty and fibrous groups. These tumors grow symmetrically, and always occur first in the suboccipital regions. These subjects are always men, and usually free drinkers of beer. In some instances, nervous disturbances, irascibility, etc., attend them. They vary in size at different times, and rest, abstinence from beer, and residence in the country, will often rapidly produce considerable diminution. They often grow to a size which gives to their possessor quite a grotesque appearance. In severe cases, not only the back of the neck, but its sides, and the sides of the face, and the shoulders, may be affected. A few cases observed by myself would appear to show that simultaneous with the fatty outgrowth there may be a definite tendency to hypertrophy of glands, both of lymphatic and those of specialized function, as, for instance, the salivary and lachrymal.

In women, so far as I know, these fatty outgrowths in the back of the neck are not met with. Women are liable, under parallel circumstances, that is, in middle life, and often with peculiar nervous disturbance, to the formation of fat masses symmetrically placed deeply in the root of the neck. These growths vary much in size, with the health and place of residence of the patient.

(*To be continued.*)

ANEURISM OF THE ASCENDING AORTA,

PERFORATING THE CHEST-WALL, AND FORMING AN ENORMOUS EXTERNAL PULSATING TUMOR IN THE RIGHT PECTORAL REGION; TREATMENT BY ELECTROLYSIS, FOLLOWED BY ARREST OF GROWTH; DEATH; NECROPSY.

By J. C. Wilson, M.D.,

PHYSICIAN TO THE PHILADELPHIA HOSPITAL, AND TO THE HOSPITAL OF THE JEFFERSON COLLEGE, ETC.

The case which forms the subject of this paper is, I think, worthy of being placed on record for two reasons: First, because of its unusual clinical features, striking in themselves; second, because it illustrates a method of treatment, here followed by useful results, of which the number of recorded cases is limited, and particularly so in English and American medical literature.

Mary M., aged seventy-four, widow, Irish, formerly a domestic, but for many years an inmate of the "Out-wards" as a pauper, was admitted to the medical ward in the Philadelphia Hospital June 16, 1885, on account of "a hard pain in a lump in her breast." The following notes were taken upon her admission to the ward by my clinical clerk, Dr. Elder:

She is a stout, large-framed woman, of more than medium height, with a hard face, a doughy skin, and an abundance of coarse yellowish-gray hair. She knows nothing of her people, except that her father died before she was born, her mother shortly afterward, and that she had no brothers or sisters. She was always healthy, and can remember no serious sickness of any kind. She bore one child that died in infancy, but upon this subject she is indisposed to talk, and will not tell whether she has been married or not. It cannot be determined that she ever had syphilis; there are no scars of syphilitic lesions. She has been intemperate, and declares that she was never sick at all, except after spells of excessive drinking.

She tells us that the pain in her breast came before the "lump." The former she has had, "off and on," for three years. It was first felt after a fall. The exact account is that she tripped in walking across the floor, and fell with great violence, striking her breast upon a block of wood. She was a great deal shaken up, but soon recovered. Shortly after this the pain came on. It has never been constant, but comes in spells in the middle of the breast, shooting at times toward the right shoulder and to the back. At other times it is more prolonged, and of a dull, aching character. This pain, however, became so distressing that she was transferred to the hospital. After a time she became weary of the restraint of the ward and asked to be discharged, although the pain was not much better. In November, 1884, a small circumscribed tumor made its appearance, somewhat to the right of the sternum, and about the level of the third costal cartilage. She was again sent to the hospital, when the diagnosis of aortic aneurism was made. The tumor at this time is described as being half the size of a hen's egg. For reasons of her own, she again left the ward and returned to the almshouse.

From this time the tumor gradually increased in size, and the pain became more severe. She began to lose rest, but her appetite continued good, and her general health was but little impaired.

Upon her last admission to the hospital (June 16, 1885) the tumor had already attained large dimensions. It occupied the whole of the subclavicular and much of the mammary region of the right side, extending from the margin of the sternum to the anterior axillary fold, and from just below the clavicle to the fifth intercostal space. It was irregularly circular in outline, with abrupt margins, and of a maximum elevation in the central portions of about 2 to 2½ inches. The upper or clavicular margin was deeply notched, and from the angle of this notch a shallow furrow extended downward and slightly toward the right, dividing the upper surface of the tumor into two lobes, one of which pointed toward the sternal notch, the other toward the shoulder. At several points the surface was marked by slight circumscribed elevations or bosses, two of which, namely, one in the sternal border and one at the upper and outer or acromial border were of a brownish-blue color, and much less resistant upon palpation than the surface elsewhere, which was, however, compressible at all points upon moderately firm pressure. To the eye, the surface of the tumor appears to be continuous with the mamma, but palpation discovers the lower margin above the base of the fifth rib, well marked, abrupt, and continuous with the circular border, as elsewhere defined.

The greatest vertical measurement, from margin to margin, over the convexity of the tumor, was about 8 inches; the greatest transverse measurement, about 8¼ inches; the longest oblique diameter, from the border nearest the shoulder to the lowest point of the sternal border, was 9⅜ inches.

The tumor was everywhere the seat of a strong, expansile, heaving, systolic impulse. The skin, as well as the deeper tissues surrounding its base, was very tender to the touch. There were no external signs of inflammation.

The heart was displaced slightly downward and to the left. Its impulse was of moderate force. There were no murmurs having their point of greatest intensity near or at the apex. At the base of the heart, over the right second costo-sternal articulation, there was heard a loud double murmur. This bruit was distinct over a somewhat limited area, which included a small part only of the tumor at its upper and sternal border, and was soon lost in the line of the carotid and subclavian arteries. It was faintly heard behind in the right supra- and interscapular spaces. At the lower part of the tumor auscultation revealed the presence of a harsh, low-pitched, but not very loud systolic bruit, which was also restricted to a limited area. The upper and outer portions of the tumor beyond the limits indicated, yielded upon auscultation a distinct systolic shock, accompanied by a faint sound like the cardiac second sound and wholly without murmur.

The præcordial percussion dulness was continuous with that of the tumor, and with flatness in the upper sternal region. There was dulness anteriorly on the right side beyond the limits of the tumor, and relative dulness on the right side posteriorly, less marked over the lower than over the upper lobe. Occasional mucous and subcrepitant râles were heard upon auscultation over the lungs. In other respects, the physical signs betrayed no lesion of the left lung.

The radial and carotid pulses, sixty-eight to seventy-two per minute, were alike in time, volume, and force on the two sides, with retardation as compared with the apex beat. The patient refused to have sphygmographic tracings taken. The pupils were alike and responded equally to light. There was no stridor. At rare intervals there occurred moderate paroxysms of dyspnœa. Cough was infrequent and usually attended with scanty, thin mucous expectoration. There had been no blood-spitting. Dysphagia was constant but not severe. The veins of the face and neck were not engorged. The temperature taken in the axilla was normal.

DIAGNOSIS.—Aneurism of the ascending aorta, perforating the chest-wall and forming an external consecutive false aneurism.

TREATMENT.—Absolute rest in bed; restricted diet with as little fluid as practicable; potassium iodide gr. x *quatuor in die*, and for the relief of pain morphinæ sulphatis gr. ¼ *p. r. n.* The last was used twice or thrice daily during her whole stay in the ward. The iodide was also given during the greater part of the time, being on two or three occasions only exchanged for chloral hydrate gr. vijss *ter in die*. Neither of these drugs appeared to exert any favorable influence in relieving pain, nor could it be seen that they favored clot formation. But this question was, under the circumstances, difficult to determine.

Ten days after admission the tumor had undergone a considerable increase in size. The notch upon its upper border, and the sulcus described above as extending from this notch, had disappeared. The measurements, which had been made from and to fixed points marked upon the skin with nitrate of silver, were found to have increased by four-fifths of an inch to an inch and one-fifth and the mass was more protuberant. The pulsation had become exaggerated and at one or two points the discolored skin threatened to yield to the internal pressure of the blood. The tenderness was such as to render any attempt to support the tissues externally by strapping or a pad impracticable.

I determined to try electrolysis. The patient was with difficulty persuaded to submit to this treatment, which was, however, carried into effect on the 28th of June.

The battery used was a modification of Stoeber's with Flemming's zinc-carbon elements. The electrolytic needles were of steel, 2½ inches in length, straight, elliptical in transverse section, $\frac{1}{16}$ x $\frac{1}{25}$ of an inch in diameter, insulated to within $\frac{7}{25}$ of an inch of the point, which was very sharp, flattened, and heavily gilt. All the apparatus was supplied by Mr. Flemming, who also rendered valuable personal assistance at the operation.

The patient was carefully informed of the nature of the procedure and cautioned against movement of any kind. Her usual quarter-grain hypodermatic dose of morphia was administered beforehand and the bed placed in a good light.

Two needles connected with the positive pole were slowly introduced into the tumor at points some distance from its upper and lateral borders. They penetrated half their length, 1¼ inches, the points being freely movable within. A large electrode covered with a thin layer of fine-grained sponge, well moistened and connected with the negative pole, was held firmly against the lower border. The battery was then put into action, five cells being at first employed and the number rapidly increased to ten, fifteen, and finally twenty cells, with a current strength estimated by Mr. Flemming at twelve milliampères.

With this number of cells the current, as tested beforehand by placing the metal tips of the conductors in white of egg in a saucer, in a few minutes formed a small, dense, translucent coagulum around the positive pole, and a large white, opaque, loose clot, the size of a marrowfat pea, around the negative pole.

The patient suffered much pain upon the introduction of the needles, and at each increase in the number of cells. An attempt to use twenty-three cells caused suffering so intense that it was at once abandoned. The current of twenty cells was kept up thirty-five minutes. At the end of this time there was no appreciable diminution in the force of the pulsation; nevertheless the sufferings of the patient were so great that it was thought best not to prolong the application.

The needles were withdrawn slowly and with a rotary movement. A few drops of blood followed the one nearest the shoulder. The points of both were much eroded. For twenty-four hours cold water compresses were constantly applied to the tumor.

June 30. It was noted that there has been less pain than before the operation, and the pulsation seems less forcible.

July 18. Less pain and no increase in size until within the last four days. There is rapid extension of the mass at its axillary border; skin much discolored, bluish, very sensitive; patient obliged to lie with the arm extended, to avoid touching it; wall at this point very thin; pulsation much stronger than elsewhere.

20th. Electrolysis was performed for the second time. As there was little apprehension of danger from embolism, it was determined to connect the needles with the negative pole, in order to secure at each point as large a coagulum as possible without regard to its texture.

Three needles were introduced: one into the thin-walled upper axillary border, one into the upper sternal border, and one into the lower sternal border. The large sponge-covered electrode was held firmly against the lower and outer border of the tumor. Twenty cells were used from the beginning. At the end of twenty-eight minutes the pulsation throughout the tumor was much diminished; in thirty-three minutes the needle at the upper sternal border had ceased to move with the cardiac rhythm; that at the lower sternal border moved but slightly; while the excursion of that in the upper axillary border was much restricted. In forty-five minutes the movement of the needles had almost ceased. The *séance* was continued one hour.

In the case of one needle only, that at the upper axillary border, was the withdrawal followed by bleeding. Here a little jet followed, which was, however, easily controlled by a compress, with the loss of not more than one fluidounce of blood. A cold water dressing was used as before. No inflammatory action supervened. The pulsation again increased after some hours, but was never so violent as before, nor did the tumor undergo further increase in the direction of its axillary border, although there was some general increase in its bulk up till the time of the patient's death, which occurred from exhaustion on the 8th of September, some weeks after the ward had been transferred to the care of my colleague, Dr. Neff.

Autopsia Cadaverica, by Dr. E. O. Shakespeare, Pathologist to the Hospital, nine hours after death. External appearances: Slight yellowish tinge of upper extremities; noteworthy appearance, that of large rounded prominence of right mammary gland and supramammary region. Its

vertical diameter measures 8 inches, its transverse, 8¼ inches; its most prominent point is 3½ inches above the level of the ribs. It extends transversely from the sternal border to the anterior axillary line, and vertically from a line just below the clavicle downwards about 8 inches. The skin over this prominence is not discolored, except at two points near the middle of its sternal border. The mass is moderately firm to the touch.

Thorax: Left pleural cavity normal, with the exception of moderately firm adhesions over posterior portion of lower lobe of left lung. Of the left lung the upper lobe is normal, the lower consolidated posteriorly. . . The lower right lobe is normal; the middle lobe very firmly attached by its upper and anterior surface to the wall of the chest and to the upper lobe; it is crepitant. The right upper lobe is compressed, and is firmly adherent to the chest-wall, so that it is torn in the attempt to remove it.

Pericardial sac obliterated by old but not very firm adhesions. Heart not opened. The right anterior wall of the thorax, together with the hemispherical tumor, was removed with the heart and vessels attached, for further examination. It was found upon entering the finger into the ascending portion of the aorta, that it was the seat of aneurismal dilatation and that there was a large aneurismal sac to the right.

Liver slightly enlarged. Its cut surface brownish-red and friable. Spleen normal. Kidneys normal in size; capsules easily stripped off; surface granular; upon section, cortex seems to be of unusual thickness and pinkish-gray in color.

A further examination which I made at a later date discovered the heart to be slightly increased in size, its muscle-substance normal; mitral leaflets sound; aortic leaflets thickened and crumpled. The aorta was extensively atheromatous, and was somewhat dilated in all its diameters, from the sinuses of Valsalva up to and including the lower part of the transverse portion, with a large sac springing from its right wall and forming an intrathoracic aneurism somewhat larger than the heart itself. This sac had greatly compressed the upper and middle lobes of the right lung and had contracted very firm and dense adhesions to the surrounding structures. It had also by pressure upon the ribs, caused displacement with crowding and extensive erosion of the second, third, and fourth ribs, the second and fourth being widely separated and the third entirely absorbed for a considerable part of its extent anteriorly. The wall of the sac had given way at the point of adhesion to the chest-wall, forming an oval opening much smaller in its diameter than the aneurism itself, by means of which the blood had found its way beneath the muscles and fascia of the chest-wall and formed the external or consecutive false aneurism which was so striking a feature of the case.

The intrathoracic aneurism contained but a small quantity of laminated clot; the external tumor was densely filled with firm laminated clot, in which, however, at the time of my examination some weeks after death, no traces of the foci presumably caused by electrolysis could be discovered.

This case belongs to the group in which traumatism plays an important part in the etiology of aortic aneurism. The pain, which was the principal and most characteristic subjective symptom, was first felt shortly after the violent fall in which the chest was struck against a block of

wood. It is usual to ascribe the lesion in these rare cases to the sudden strain brought upon the walls of the artery, in consequence of the effort made by the patient in falling to save himself rather than to any direct injury to the arterial coats.[1] It appears to me that in this case the blow, leading, as it must have done, to forcible compression of the aorta, at the moment already overfilled by the sudden effort to avoid the fall, greatly increased by its direct effect the already excessive arterial pressure and so caused the walls to yield, not in the direction of the blow, but laterally. Old age and alcohol had without doubt rendered the arterial coats peculiarly incapable of bearing such a sudden strain.

Scarcely less worthy of note than the enormous size of the aneurism both inside of and outside of the chest-wall, is the almost complete absence of pressure-signs. This is to be explained by the direction taken by the sac from the right antero-lateral aspect of the ascending aorta, and affords a striking example of the immunity from pressure which the important structures of the mediastinum may enjoy in thoracic aneurisms of even exceptional size.

The case was a peculiarly favorable one for the use of galvanism. The tumor was external, of very rapid growth under observation, and there was such straining of the walls as to make the danger of rupture imminent. While there were no means of knowing the exact mode of its communication with the intrathoracic sac, still it was evident that the opening was somewhat constricted and that the risk of embolism must be slight. Nevertheless, at the first *séance* I selected the positive pole on account of the firmer clot which it causes. This attempt was followed by at best only a partial success, for the reason that the foci of coagulation were probably too small. Nor do I now think the time—thirty-five minutes—was sufficiently long. The second *séance* may be regarded as, under the circumstances, altogether successful. During the time that the three needles remained in position and connected with the battery, pulsation almost ceased. To be sure, it returned, but it was never again so violent or so extensive as before. Nor did it possess to the same extent its former expansile character. The mass, it is true, increased afterward somewhat in size, especially in thickness, but this increase was very slow and the measurements after death were little different from those at the date of the second operation. From that date, also, the disposition to dangerous local bulging was arrested. Moreover, from that period the consistence of the tumor was at all points notably firmer.

Notwithstanding the theoretical objections urged against the introduction of needles connected with the negative pole, the results in this case indicate its superiority to that method in which they are connected with

[1] See also Bramwell: Diseases of the Heart, 1884, pp. 699,700.

the positive pole, when it is sought to promote the rapid coagulation of a large mass of blood in an external false sac. The relative merits of these methods as compared with the alternate method of Ciniselli, or the introduction of needles connected with both poles, as advocated by Duncan, Balfour, and others, can only be determined by a critical analysis of the recorded cases.

TREATMENT OF INTESTINAL OBSTRUCTION BY THE FORCE-PUMP.

By H. Illoway, M.D.,
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The treatment of intestinal obstruction is still, to-day, an unsettled question. The method of treatment first devised, that by cathartics, is universally condemned. Sir Thomas Watson thus forcibly expresses himself upon this point: "Withhold purgatives in those cases because they are not merely useless, but positively hurtful—hurtful not only in the late, but in the early stage of the obstructive process; not merely condemned by an experience which is sometimes equivocal, but contra-indicated by whatever rational principles can be deduced from the physiology and pathology of the malady."[1] Dr. Syer Bristowe expresses himself in a similar manner: "Here, as in most other kinds of obstructive disease, all forms of purgatives must be eschewed, everything, in fact, must be avoided which can have the effect of promoting peristalsis; for violent movements of the bowels, independently of any other mischief they may effect, naturally tend to increase the size of the intussusception."[2]

Though it can be justly claimed that the treatment by cathartics is based upon a rational principle, that of promoting peristalsis, and thereby a righting of the difficulty, nevertheless it is sufficiently well established by experience that such a method is attended with the greatest dangers, liability to light up a most dangerous inflammation and ulceration, and even cause perforation of the bowels by the violence of the contractions, for only the most powerful of this class of remedial agents could prove of any avail. Furthermore, experience has shown that in some cases[3] where they have been administered they have proved totally ineffective, as if nothing more than so much water had been taken.

[1] Watson's Practice of Medicine.
[2] Reynolds's System of Medicine, article "Obstruction of the Bowels," by John Syer Bristowe, M.D., F.R.C.P.
[3] Well illustrated by Case I. in this paper.

The other method is that by opium. Though this is the one most favored and usually resorted to, being the safest so far as causing any trouble *eo ipso* is concerned, it has certainly no other *raison d'etre* than that of keeping the bowels quiet and quieting the pain, trusting to the *vis medicatrix naturæ* to cure the patient by its own unknown and invisible methods.

The treatment by belladonna suggested by Prof. Brinton has not come into general use. Though successes have been reported with it, still many authorities ignore it altogether; *e. g.*, Mr. F. Treves in his Jacksonian prize essay on this subject.

Another and most important question has arisen lately in connection with this disease and one that has a most important bearing upon the plan of treatment to be pursued, namely, the question of operation. Abdominal surgery, to-day, has certainly made the greatest strides forward, and the opening of the abdomen is an everyday occurrence.

It is certainly a pertinent question, if so many and grave diseases as are known to the gynecologist can be successfully treated by an operation, if that gravest of diseases, acute peritonitis, can be treated by surgical interference, and with such remarkable success as reported by Lawson Tait,[1] why should not the same be the case with intestinal obstruction? Though it is true that the statistics of the operation undertaken for this cause are certainly not very favorable and in no way compare with the favorable showing made by ovariotomy, or even by the operation for strangulated hernia, still it cannot be denied that this is in a great measure due, not to the operation *per se*, but, as I venture to believe, to the lateness of its performance. In obstruction of the bowels the conditions are altogether different from those of the various other affections, and time certainly plays a most important *rôle*. If the condition of things be such that an operation is the only means by which the disease can be cured, then this remedy must be applied early to be successful. The liability to severe inflammation, exudation, formation of adhesions, of pus, and severe general shock, makes a delay of even a few hours of the greatest importance, for an operation which a little earlier might have been positively successful may now, a few hours later, be fraught with great danger to the life of the patient.

There can, therefore, be no question that if operative procedure is to be invoked it should be done very early. But here we are met with the objection that many cases recover without an operation, and as there is always a certain amount of danger attendant upon an operation, why should this additional danger be thrust upon the patient?

[1] British Medical Journal, 1885. Nine cases of acute peritonitis treated surgically by Lawson Tait; the abdomen freely opened, the surfaces of the intestines carefully washed of the pus and other fluid exuded, and proper drainage carefully established. Union Médicale du Canada, September, 1885.

The great difficulty attendant upon the whole plan of treatment lies therein, that the forms of occlusion presenting themselves to us, that due to impacted feces excepted, are difficult of exact diagnosis. On this point Mr. Nelson C. Dobbs thus remarks: "The mere recital of these forms of obstruction might almost lead one to suppose that the question of determining the precise cause of the occlusion in any given case might be a simple matter, but in actual practice it is by no means easy. There is much yet to be learned and perfected in the way of diagnosis before the surgeon can hope satisfactorily and scientifically to relieve these cases by an operation. I have no intention myself to attempt anything like a differential diagnosis. I am conscious that in the present state of our knowledge the most we can do in many cases is to determine the actual existence of acute intestinal obstruction, and in some instances, perhaps, its seat, but in most the precise anatomical lesion that determines the occlusion cannot be diagnosed whether it be by bands, or acute kinking, or other cause."[1]

It is certain that there are cases wherein nothing but surgical interference can relieve the patient. Such are where the obstruction is due to *compression* or *traction*, where the bowel becomes obstructed by the compression, or the pressure, or the traction exerted upon it by adhesions, or growths, or deposits situated externally to it, and in which there is no contraction inherent in the walls themselves, or where it is due to *internal strangulation*, where the bowel is constricted or nipped by the edges of some natural, or artificial orifice through which it protrudes.[2] The cases of obstruction should, therefore, so far as treatment is concerned, be classified under two heads:

1. Cases which can be relieved by medical treatment.
2. Cases which require operative interference.

As already stated, the line of demarcation, from a diagnostic standpoint, between these two great divisions is not so sharply drawn as to be always readily discernible, and, as a rule, a great many medical trials are made and much precious time wasted before the fact is recognized that by surgery alone can we hope to save our patient.

It is, therefore, a great desideratum that the treatment employed should be such as to determine quickly one of two results—either the cure of the patient, or the clear indication that operative interference is absolutely necessary. At the same time this treatment, though effective, should be of such character as in no way to prejudice the case and endanger the success of an operation should this become necessary.

Have we any remedial means at our disposal that can accomplish this? To demonstrate that we have such, is the object of this paper.

[1] Proceedings of the Bath and Bristol Branch of the British Medical Association, Bristol Medico-Chirurgical Journal, March, 1885.

[2] Reynolds's System of Medicine, article "Obstruction of the Bowels"

It is to-day a recognized fact that enemata are the treatment *par excellence* for intestinal obstruction, and if other remedies and methods be still resorted to, it is owing to the fact that the ordinary instruments employed for this purpose are not powerful enough, and therefore do not answer the purpose. To obviate this difficulty various adjuvants have been employed to aid the instrument in accomplishing its object. In 1869 Dr. Thomas Hay, of Philadelphia, in a long and excellent article,[1] sought to revive the use of the long tube introduced by O'Beirne. Without questioning the ability of the author of that article, there cannot, nevertheless, be the slightest doubt that it is a procedure requiring, to say the least, the greatest dexterity to pass the tube beyond the sigmoid flexure, and in a majority of cases it will be found impossible. In a discussion upon this subject Mr. Treves,[2] the author of a prize essay on "Intestinal Obstruction," says as follows: "It is of interest to note that many surgeons still cling, in a spirit of simple and trustful faith, to the 'long tube.' They appear to regard it as a kind of fetish, as an inanimate thing to be invoked as a last resort when in dire distress. History tells us that this remarkable pipe has been passed many feet into the colon, that it has reached the transverse colon, and that it has found its way even into the cæcum. I can only say that the adventures of this tube and the anatomy of the colon do not quite agree; there is a discrepancy somewhere, and, of course, it may be that the bowel is at fault. After many patient trials upon many dead bodies I have not yet succeeded in passing this interesting pipe beyond the sigmoid flexure. Several feet of it have disappeared within the anus, and its tip has been felt about the umbilicus and even the right iliac region, but the mobile sigmoid flexure has explained it all, and beyond that loop the good tube has not passed."

In the discussion Mr. Mitchell Clarke expressed himself in the same tenor. "He was very glad to hear that an opinion he had long held with regard to the long tube (O'Beirne's) was shared by so high an authority as Mr. Treves. It is well known to members of this branch that he had long held that it was very difficult, if not generally impossible, to pass this tube through the sigmoid flexure of the colon. . . . Subsequently some experiments were made in the post-mortem room of the Bristol Infirmary, and it was found that the tube could not be passed."

In *La France Médicale*, of June 5, 1884, we find a report by Dr. Poupon, Interne of Hospitals, describing the relief of a case of intestinal occlusion by means of what may be termed an electrical enema, or, better, an enema charged with electricity. It is as follows:

"A young man, aged twenty, after drinking a glass of wine was seized with violent colic and bilious vomiting. On his admission into the hospital his

[1] Medical and Surgical Reporter, Philadelphia, November 6, 1869.

[2] Bristol Meeting of the Bath and Bristol Branch of the British Medical Association. Bristol Medico-Chirurgical Review, March, 1885.

face was pinched, his pulse small and frequent. An inspection of the epigastric region revealed a rather voluminous tumor starting from the right flank and extending into the left hypochondriac region following the course of the transverse colon. Diagnosis, intestinal occlusion. Two siphons of seltzer water were injected into the rectum, and faradization applied, but without success. Equally fruitless were hypodermic injections of morphia and the applications of ice. The belly was very much distended, and the pain intense. Before resorting to a surgical operation, Dr. Budet, of Paris, was requested to administer an electrical enema." This is the method as described by Dr. Budet himself at a medical congress in Vienna, Oct. 6, 1883. It must be premised that the doctor employs only galvanism for the reason that faradic currents give rise to a rapid knotty contracture, whilst galvanic currents produce but a slow contraction, that tends to propagate itself onward. "One difficulty arrested me in the use of the galvanic current; these currents have in reality a very intense chemical action, capable of rapidly disorganizing the tissues at the points where they come in contact with them. But to be efficacious it is necessary to employ very energetic currents and to bring them in direct contact with the intestine, whence the danger of producing eschars of the parietes of this organ. I then devised a particular intestinal excitor. It consists of a large rubber sound provided with a hollow metallic mandrel (like the wire running in the ordinary vulcanized rubber catheter) connected by a supple wire with one pole of the battery. This mandrel does not reach further than about one centimetre above the lateral orifice of the rubber sound. The external end of the mandrel is connected by means of a rubber tube of sufficient length to an ordinary irrigator filled with salt water. The sound once introduced, the water is injected, the mandrel serves as a conductor of electricity, and transmits the same to the water, which then bathes the intestines to a considerable extent. In this manner all danger of the cautery is avoided, and currents of even enormous intensity may be thus employed. The other pole of the battery is placed over the region of the kidneys or abdomen, according to the case under treatment."[1]

It is clear, therefore, that as to the first method it is the opinion of competent medical men that it is entirely valueless. As to the second method, without going into the question as to whether it is really an electrical enema; whether the salt water, once out of the tube, and therefore not in contact with the current-conveying body, really carries the galvanic current on with it or not, it is sufficiently apparent that the method, though perhaps applicable in hospitals, is one attended with the greatest difficulties in private practice—difficulties that are at times insurmountable.

An enema to be effective in the treatment of this disease must be possessed of two qualities; this, in my opinion, is a *sin qua non*.

1st. It must have penetrating power to pass beyond the ileo-cæcal valve and into the small intestines.

2d. It must be possessed of sufficient force to produce peristaltic action.

1. It cannot be questioned any longer that, with a suitable instrument, water can be thrown beyond the Bauhinian valve. Prof. Felix Niemeyer states this explicitly in his *Handbuch der Speciellen Pathologie und Therapie*.[2] Prof. Rothacker, Pathologist to the Cincinnati Hospital,

[1] Gazette Médicale de Nantes, No. 9, July, 1884.

[2] Handbuch der Speciellen Pathologie und Therapie. Prof. Felix Niemeyer. 9th edition, vol. i.

has demonstrated this fact in the post-mortem room of the hospital.[1] In a paper presented to the American Medical Association, at its meeting in Buffalo, June, 1878, entitled "Permeability of the entire Alimentary Canal by Enema, with some of its Surgical Applications," Dr. Robert Battey, of Rome, Ga., asserts the permeability of the entire alimentary tract by enema, and verifies his statement by the recital of his own clinical observations and experiments upon the cadaver. In this interesting paper are quoted cases reported by others, and among them the excellent observation of Dr. T. S. Mitchell, of Hamilton, Ga. This latter gentleman remarks in his paper as follows: "To satisfy myself of the full permeability of the canal, I returned the following day, and injecting a half pint of castor oil into the rectum, followed it with a large injection of warm water until vomiting occurred. The patient distinctly tasted the castor oil in the vomited fluid, and the oil globules were abundantly floating upon the ejected liquid."[2] My own clinical experience has fully convinced me that water can be directly forced beyond the valve of Bauhinius with a suitable instrument.

Lately a lecture, delivered by Prof. W. W. Dawson,[3] wherein a contrary statement is made, has been quite extensively quoted. Prof. Dawson, in demonstrating to students how far up into the bowels an injection could be thrown, was very much surprised to find that it went beyond the valve into the ileum. He was astonished, as it was but the second time in fourteen experiments that this had occurred. As to the first time he says: "When I first saw the valve yield, Dr. Louis C. Brown, Demonstrator of Anatomy at this Institution, used a powerful syringe; the fluid passed from the large to the small bowel without arrest, from thence on through the stomach and œsophagus until it appeared at the mouth." Without any investigation, however (which could have been very easily made), as to the condition of the valves in the first case, without any investigation into the condition of the valves in the case before him, but basing himself merely upon the twelve cases in which he had not succeeded, he concludes: "The experiments I have given show that the valve when intact—when in normal condition—will not allow retrograde passage. In the case before you, and in that of Dr. Brown, the valve was doubtless imperfect."

To this statement of Prof. Dawson, in view of the preponderance of evidence both clinical and experimental, in view of his own two successes, no weight can be attached, and until he shall have demonstrated upon the cadaver the truth of his hypothesis we shall hold to the contrary opinion, that fluids can be thrown past the ileo-cæcal valve, and that the cause for his twelve failures must be sought for elsewhere than in a

[1] See note to article "Remarks on Intestinal Obstruction." By H. Illoway, M.D., N. Y. Medical Record, No. 27, Dec. 30, 1882.

[2] Virginia Medical Monthly, Oct. 1878, containing synopsis of Dr. Battey's article.

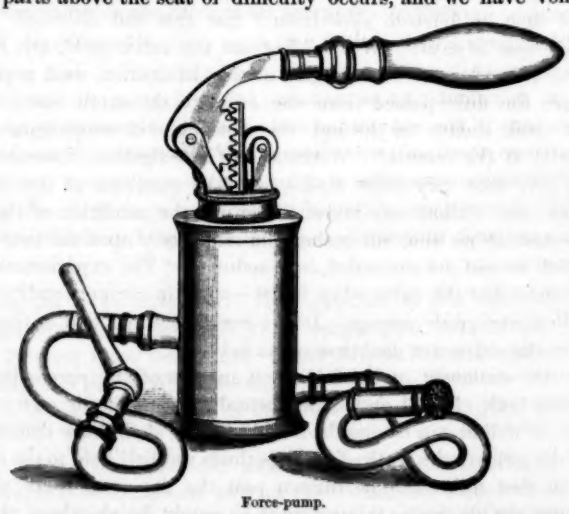
[3] Lancet and Clinic, Feb. 21, 1885. Lecture by Prof. W. W. Dawson, M.D.

supposed normal condition of the valve; most probably in the use of weak or faulty injecting instruments; too great cadaveric rigidity; perhaps in some pathological condition that would have been discovered had search been made.

2. Trousseau says: "You can readily understand how intestinal occlusion may be the consequence of this invagination. It is not, however, an inevitable consequence, for a vigorous contraction of the intestine may suffice to reëstablish the normal condition."[1] It is a well-established fact that in many cases, it might be said in almost the greater number, there supervenes a condition of paresis of the muscular structure of the intestinal tract from sudden distention of the parts by large quantities of gas, a usual concomitant of many forms of obstruction; from pathological changes inhibiting the action of the nerves; from long-continued pressure of hardened feces. The peristaltic action, proper and normal, capable of righting the difficulty is thus inhibited.

It is, therefore, absolutely necessary that the enema should have such powerful exciting influence on the muscular structures and on the inhibited nerves as to produce normal, easy, imperceptible peristaltic action.

It happens also frequently that, later on in the course of the disease, nature seeking an outlet for the accumulated material, or from direct excitation produced by remedies administered, a reversed peristaltic action of the parts above the seat of difficulty occurs, and we have vomiting.



Force-pump.

This is a grave condition, and generally hastens the fatal result. To bring relief even to so serious a condition, there must be enough power in the enema to reverse this action—to bring it back to its normal form.

[1] Trousseau, Clinical Lectures, article Int. Obstr., vol. ii. Philadelphia, 1873.

The peristaltic action here referred to, which is absolutely necessary for the relief of the case, is the gradual, undulatory peristalsis of the healthy state, and not the violent, knotty, and painful contractions produced by powerful cathartics.

The instrument possessing these qualifications, and therefore adapted to the treatment of this disease, is the force-pump. The one used by me in the treatment of the cases here recorded, has a cylinder three inches long and six inches in circumference (see figure). It is supplied with a suction and delivery pipe. It is operated by a handle to which is attached the segment of a gear-wheel; this mashes in a rack, which is part of the piston rod. It has a stroke of one and a half inches.

This pump throws a continuous, unbroken stream. It is evident that great force can be exerted with such an instrument. It has power enough to throw the stream beyond the ileo-cæcal valve and up into the small intestines, as shown by Case I. It possesses force enough to stimulate the intestinal tract and provoke peristaltic action where even the most powerful cathartics had failed, as recited in Case I., and even where the action had been reversed, vomiting ensued, and the patient seemed near his end, as in Case II.

Case I.—In December, 1878, I was requested by my friend Dr. Keck to see with him a case of intestinal obstruction. A boy, aged fourteen, of German parentage, was the patient. He was of flabby habit, rather dull, neither working nor studying, living on cakes, coffee, and slops, and not much given to substantial food. The doctor had been called two days before, and learned a history of what he supposed, at the time, to be ordinary constipation. He ordered him a laxative. This did not act. He then directed pills containing extr. colocynth co., grs. xij, and calomel, grs. xxiv. He took all, and still no action. He was then ordered *six drops* of croton oil in pills. This proved no more effectual than the other remedies.

I examined the abdomen carefully, and found about the region of the umbilicus an elevation which was rather sore on pressure. The boy also complained of pains shooting out from this spot. My diagnosis was intussusception.

I had at one time noticed in the office of the late Dr. Holdt a syringe constructed like a pump, and throwing a continuous stream with considerable force. I advised against any further medication, and suggested to my colleague that I would procure the above-mentioned instrument, and that we should try enemata. We returned in the evening, Dr. Holdt kindly loaning me his instrument. I threw into the bowels nearly a basinful of cold water—in fact, so much that the patient cried out that he could no longer bear it. He got upon the chamber, and the water passed from him very much colored with fecal matter. Five minutes thereafter we gave him another injection, until he cried he could not hold it any longer. This time he had a large fecal evacuation —very fluid, of course, from the large quantity of water injected. We now ordered him quinia in one grain doses, with tinct. nuc. vom., and left him. In the morning we found him much improved, his bowels had moved several times during the night, and once in the morning. In three days more he was up and about.

CASE II.—Mr. F., aged seventy, an old gentleman, hale and hearty, very active, and a good eater; much subject to flatulent colic. I had treated him at various times for these attacks, and always succeeded in relieving him by a hypodermic injection of morphia, ♏x to ♏xv Magendie's solution, nothing further being required. He stated that when these attacks came on, it seemed to him as if something had knotted in the right hypochondriac region.

In the winter of 1880 I was called to see the old gentleman, who was again complaining of an attack of colic. I gave him a hypodermic injection of morphia. Next morning early I was summoned to him again, and found that he was still suffering severely. I ordered him a pill of opium, half a grain, and extract hyosciam., half a grain, to be taken every two or three hours, as the severity of the pain might demand. This was continued for two days. He now had difficulty in micturition, passing but little urine, and that with much pain. The pains in the bowels still very severe. Vomiting of biliary matter had set in. Dr. Forchheimer was called in consultation. He examined the case, and we agreed upon a purgative in the shape of calomel and jalap. This was at two A. M. In the morning I visited my patient, and found his condition very bad. Countenance anxious, and expressive of great agony. Continued vomiting of biliary matter; small, feeble pulse. He had summoned his children, in the expectation of speedy dissolution. The powders were vomited almost as soon as swallowed. His wife, upon her own responsibility, had administered to him during the night about twelve injections, both from a fountain and Davidson syringe. None of these injections, she assured me, had passed from him. I had brought with me (by the kindness of Dr. Holdt) the same syringe which had previously proved so effectual. Fearing to add to the shock in this case, I determined to use hot water. I accordingly had a large china washbowl, full of water, brought in, cooled it to the temperature of 106° F., and then proceeded to pump him full, until he could hold no more; whilst he rubbed himself about the umbilicus and said he felt the water go all through him. He got upon the chamber, when the injection passed off with a large discharge of gas. Five minutes later I gave him another injection, of about the same quantity as before; this time, however, the temperature of the water was 90.° F. This was very soon discharged with some fecal matter, and considerable quantity of flatus.

He now felt much better. The pain was very much relieved, and the vomiting arrested. I then waited fifteen minutes and gave him another injection, water at 106° F. This soon passed away, with considerable fecal matter and gas; pain completely relieved. I now left him, directing him to take some beef broth and brandy at intervals. Returned in the evening, and found him doing very well; had had two more evacuations since morning; passed urine freely; had taken the beef broth and brandy with great relish. Completely relieved of pain. There was considerable soreness over the abdomen; more so in the right hypochondrium. He felt very much prostrated. He was now ordered a tonic, kept on light nutritious food, and in a week was on his feet again, attending to his duties as usual.[1]

CASE III.—August 24, 1883, at 5 A. M., I was called up to go and see Mr. I. A. He was suffering with the cramps, the messenger said. I

[1] These two cases were published in a brief article on this subject in the Medical Record of December 20, 1882. They are republished here that the chain of clinical evidence in favor of this method may be complete.

immediately armed myself with my hypodermic syringe and proceeded to the house. Mr. I. A. is a gentleman of about fifty years, of stout habit, and quite an expansive abdomen. He had formerly gone through considerable illness, but of late years had been quite well. He is methodical in his habits as to diet and rest. Reaching the house, I found the old gentleman in bed, restless, and shrieking with pain. Examining the abdomen, I found a marked elevation in the right iliac and hypochondriac regions, extending very nearly to the median line. Upon slight percussion, such as was only possible under the circumstances, this region was found markedly tympanitic. The patient screamed for relief from the atrocious pain that was tearing him to pieces. I administered a hypodermic injection of ℥xv Magendie's solution of morphia. A quarter of an hour elapsed, and no relief. I administered another hypodermic injection of the same strength. Still no relief; the patient continued as before. I now proceeded to give him rectal injections with an ordinary Davidson's syringe, which I found in the house. The fluid passed away from him, but there was no improvement. I administered about half a dozen such injections, varying them with oil, with turpentine, with salt, but the condition remained as before, with this aggravation: that the patient, who is rather of nervo-sanguine temperament, was becoming greatly alarmed at the failure to relieve him.

I now realized that I had a case of intestinal obstruction to deal with, of the ileo-cæcal variety, and at once sent for my force-pump. Till now about two hours had elapsed, with the various fruitless attempts and manœuvres. The syringe brought, I got a china basin (one of the kind that usually comes with chamber sets) about three-fourths full of hot water, temperature 103° F., and, adding a little salt and about twenty drops of spirits of turpentine, proceeded to pump my patient full. I injected into him nearly the whole quantity of water. He got upon the chamber, the water began to pass, then suddenly there was a loud discharge of flatus. Observing him whilst he was on the vessel, I noticed at once, with the evacuation of the gas, a change for the better. The face, that had been pinched and drawn, as is common in acute intestinal suffering, now resumed its natural appearance, and a sense of comfort thereon began to manifest itself. He had a fecal evacuation. The patient was now greatly relieved; he lay down and rested quietly. In twenty minutes I repeated the injection, and another fecal evacuation followed. The patient was now calm, and soon thereafter fell asleep. Although the obstruction was relieved and the flatus evacuated, the patient still felt great soreness in this region, and the general manifestations led me to believe in an incipient inflammation. However, under the use of opium combined with small doses of blue mass, and occasionally doses of castor oil, these manifestations disappeared, and in ten days the patient was out.

I am satisfied that, if relief had not been so promptly afforded in this case, a very dangerous and violent inflammation would have rapidly supervened, and the patient would have succumbed.

As recited in the histories of the cases here recorded, I supplemented the powerful action of the force-pump by using water either cold, at a temperature of about 65° to 70° F., or hot, from 100° to 106° F. In Case I., a young boy of phlegmatic habit, with no symptoms of inflam-

mation, with very little pain, with a decidedly lethargic condition of the general system, I used cold water. In Case II., an old man of over seventy, and very much debilitated by suffering and inability to take food; and in Case III., also a man past his prime, of nervous temperament, and very susceptible to suffering, there was the probability of an acute congestive or inflammatory condition being present, and I used hot water—more agreeable to the sensations of the patient, and less liable to produce severe shock. By this method, besides obtaining rapid relief for the patient, there was also gained the beneficial effect of the hot or cold water upon the walls of the intestines. It is superior to the opium treatment, in that it cures the patient and thereby relieves him promptly of his suffering, whilst opium frequently fails to accomplish the sole purpose of its administration—the relief of pain. This is well demonstrated by Cases II. and III.

The superiority of the plan of treatment by the force-pump, supplemented by the use of water, either hot or cold, has been clearly demonstrated by the cases here recorded. It possesses, moreover, another advantage over all other plans of treatment and one that is certainly of the greatest importance both to patient and physician, namely, that it differentiates clearly and distinctly whether a given case requires a surgical operation or not.

I believe that if after careful trial of the force-pump we fail to relieve our patient, we may rest assured that *nothing but a surgical operation* can cure him. This indication will be given early, and no time need be wasted with futile tentatives, and the chances of success for such operation will be increased a hundredfold from what they are to-day, when operations are usually resorted to after everything else has proved inefficient, after much precious time has been consumed and the patient is almost moribund.[1] This belief is confirmed by the following clinical experience.

Case IV.—August 29, 1884, I was called to see a young girl aged thirteen. She was of excellent development, rather tall for her age, and very bright. She had just returned a few days ago from the country, where she had been spending her vacation with relatives. Her mother told me she had a severe diarrhœa, having gone to the water-closet about fifteen times. I asked my patient, and she confirmed the statement. She had no fever. Her tongue was slightly coated. Her belly was somewhat tender to the touch; not markedly tympanitic. Her mother stated that she had been eating a great deal of fruit. I prescribed a mixture of bismuth with aromatic syrup of rhubarb to be taken internally, and iodine with aconite to be painted over the abdomen, and placed the girl on a bread and milk diet.

Sunday the 31st, I was again called to see the girl. The pain had

[1] Since writing this article I find that Mr. F. Treves, in an address before the British Medical Association, has expressed himself in a manner coinciding with the views of the writer as stated in the article in the Medical Record, December 30, 1882, as to the necessity of operating early in these cases. See Medical Record, August 16, 1885.

not abated and she was still suffering with diarrhœa. Inquiring as to the effect of the first remedy, I learned that she had felt better and that on Saturday she had dressed and gone out with some girls of her own age to make some visits, and at the house of a friend she had eaten a couple of large pickles. Her mother believed that in consequence of this indiscretion her diarrhœa had begun again. For some reason or other, I had doubts as to the correctness of this statement, and, therefore, directed her not to let her daughter go to the water-closet any more, but when she felt that her bowels were going to be moved, to let her go upon a vessel, and to be sure to examine the stools. For the present I prescribed nothing. Upon my visit Monday morning the mother told a different tale. The girl had gotten up about every twenty minutes, but there was no stool. She would sit for awhile upon the vessel and always seemed loath to get up from it, and had some tenesmus. I now began to suspect some grave trouble. I wanted to give her an injection, but they had no syringe. I returned in the evening bringing my pump with me, and proceeded to give her a large injection of water, temperature about 100° F. The water passed from her without bringing any fecal matter. As she was very restless and experienced some pain, I directed a few small doses of morphia to be administered during the night. It was now plain to me that I had to deal with a case of intestinal obstruction, but of what character I could not tell. There was nothing in the external appearance of the abdomen to give any indication, and the tenderness and pain were generalized over the whole region. Next day on my visit, I found the patient had rested somewhat during the night, but there was some elevation of temperature, the thermometer in the axilla showing 100°; complete anorexia, and considerable thirst. She retched a good deal. The abdomen was more tense, but it seemed to me not quite so tender. I repeated the injections, but with no better result than the evening before. I then requested that a consultation be called. It was now for the first time that, realizing the seriousness of the case, the mother gave me a full history. It was as follows: The girl, whilst on her visit happened to be playing with some girls when they came across a heavy piece of iron lying on the ground; wagers were made as to who could and who could not lift it from its place. My patient lifted it, but from that time she walked with a marked stoop and could not straighten herself when asked to do so. The friends in the country with whom she was staying gave her pills and other forms of purgatives. Seeing, after ten days, that she still stooped, they sent her home, a distance of 150 miles, which she travelled by boat. On her arrival she did not complain much, ate as usual, went out and paid visits, and seemed well with the exception of this bending over. Her mother after a few days took her to the Dispensary of the Ohio Medical College to have something done for her back. There she was told that nothing could be done for the present, but that she should return at some future day. During this time the girl was going constantly to the water-closet and had movements of her bowels once or twice a day.

This history certainly rendered the aspect of the case more serious, as nearly a month's precious time had been lost.

Prof. C. G. Comegys, M.D., was called in consultation and saw the case with me in the evening. He confirmed the diagnosis and agreed with me in the treatment. It remained fruitless. I was now convinced that nothing but an operation would relieve the case, and accordingly

requested Dr. T. A. Reamy to see the patient. He saw her Wednesday afternoon. Her condition was now very grave indeed. There were marked febrile movement, great thirst, frequent vomiting, and great prostration. There was also a constant desire to go to stool, and every little while she would get on the vessel and would sit and sit, and was with difficulty put back to bed. I urged the necessity of the operation as the only measure promising success and capable of averting a fatal ending. Prof. Reamy agreed with me as to the advisability of the proposed measure, but her parents would not consent. With that obstinacy born of ignorance and stupidity they would not listen to any argument—"if the child was to die, she might as well do so without an operation." And Friday night she died, more, it seemed to me, from exhaustion, than from the disease itself.

I was desirous of making a post-mortem examination, to discover first the pathological condition, and, secondly, whether an operation would have been beneficial or not. With considerable difficulty I obtained the parent's consent thereto, upon pledging my word that nothing but the abdomen should be opened, that nothing should be removed, and by permitting two laymen to be present. Accordingly, Saturday evening, the post-mortem was made; there were present, Prof. Reamy, myself, and Dr. Jos. Eichberg, pathologist to the Cincinnati Hospital, who kindly volunteered to do the work. Upon opening the abdomen a great quantity of fluid, almost like a dropsical effusion, escaped. The peritoneum presented evidence of very recent inflammation. The intestines were now carefully examined; there were no inflammatory bands around them. A knuckle of the ileum was found passed through a slit in the omentum and bent upon itself. The intestinal structures about the region of the incarcerated portion were somewhat softened. In some portions of the small intestine there were noticed small holes, as if made by a punch; from the lack of any evidence of severe inflammation in the surrounding structure and in the immediate neighborhood, and from the generally healthy appearance of the intestines, I was led to the belief that these were post-mortem occurrences; if not, they might have happened in the last thirty-six hours when the vitality was already very low.

It is apparent that the opinion held as to the form of obstruction, an opinion derived from a failure of the force-pump to relieve, was correct.

Secondly, it is clearly evident that an operation would have certainly cured the case,—a slight snipping of the omentum being all that was required.

Though the cases be few in number, still, from the rapid and brilliant manner in which Cases I., II., and III. were cured, the certainty with which the diagnosis was made in Case IV. and verified by post-mortem examination, the following conclusions can be justly drawn therefrom:

1st. Enemata are superior to every other method of treatment.

a. In the rapidity with which the cases are relieved.

b. And in clearly indicating whether a surgical operation will be required.

2d. They are entirely safe and free from all danger, and in no way prejudice the case should a surgical operation become necessary.

REVIEWS.

GENERAL ANÆSTHESIA AND ANÆSTHETICS.

THE PRACTICE OF ARTIFICIAL ANÆSTHETICS. By DUDLEY W. BUXTON, M.D., B.S., M.R.C.P., Administrator of Anæsthetics at University College Hospital.

ON ANÆSTHESIA. By R. MILNE MURRAY, M.B.

ON ANÆSTHETICS. By JOHN CHIENE, F.R.C.S. Ed., F.R.S.E., Professor of Surgery in the University of Edinburgh.

THESE are the titles of a series of papers read before the British Medical Association at its last meeting, and published in the *British Medical Journal* for Sept. 19, 1885. Such a series of papers upon anæsthetics written by men selected, as especially fitted for the purpose, by a society so high in standing and so fruitful in good works as the British Medical Association, cannot but attract the attention and excite the interest of every one. Such papers deserve careful examination. From them may be learned what, at the present time, can be accepted as settled in regard to anæsthetics; what, if any, recent advances have been made; what points yet remain upon which opinion is divided. From them our readers will be enabled to compare the theory and the practice of surgical anæsthetics here, with those of their professional brethren of another country, of one which has done so much, in so many ways, to advance the knowledge and promote the use of anæsthetic agents.

These papers are not, of course, elaborate or exhaustive, no one of them extending beyond a length for comfortable reading at a single sitting. The one by Dr. Buxton is largely, and that by Dr. Murray entirely, devoted to the physiological aspects of the subject, while that by Mr. Chiene, and the debate, which is brief, tend largely toward the more practical points. All of them bear evidence of thorough acquaintance with the subject, all show care and study in the preparation and an evident effort to bring the subject up to the latest time. One notable exception, however, must be made to the last clause of this general statement. The paper by Mr. Chiene is stated to be a reprint of a lecture delivered by him to his class in 1876. Now whether it is just the proper thing to present to such an Association, upon a subject so important as this, matter ten years old, is for others to determine. This much, however, is very certain: if the profession has not advanced as to anæsthetics within the last decade beyond Mr. Chiene's paper, or farther than is indicated in the few added passages placed in brackets, then there is much to deplore. Further, it may be said, that the man who can say that he has "nothing to retract and very little to add" as to his knowledge of the

subject as it was ten years ago, is strangely oblivious to what has gone on around him.

The first conclusion arrived at from perusal of these papers is, that there are some points concerning anæsthetics which seem to be settled. These may be first disposed of. Thus, we find no mention of "idiosyncrasy" as an explanation of death under these agents. It has figured all through the history of the subject, but with gradually decreasing importance. It was a bugbear which should have been banished after even the first few deaths had occurred to persons who had taken the anæsthetic before, because idiosyncrasies do not change from day to day. It seems now to have disappeared; let us hope that it be forever.

Etherization by the rectum finds here no assistance toward professional favor. It receives but scant mention, no praise, and full recognition of its dangers.

The conclusion seems to be, that the agents which are now in daily use are the best known. No new anæsthetic is brought forward and the use of none but the standard ones advocated. Methylene is again stated to be nothing more than diluted chloroform. Methylene dichloride is "a substance very difficult to prepare and very costly," while amylene and ethidene have a bad record as to safety. Effort, is therefore, to be directed to a better knowledge of the action of those we now have, rather than to "a superficial, if showy, acquaintance with the plethora of agents which already glut the anæsthetist's armamentarium." No one who reflects upon the immense experience we have had with ether and choloroform, can fail to assent to this. A vast length of time must elapse before we could possibly acquire an equal amount of experience with other agents, and when we consider the low rate of mortality from the agents we now have, we can see how much longer would be the time before we could be sure that others are safer. Possibly chemistry may make some brilliant discovery of a general anæsthetic which, like cocaine, will abolish pain without affecting consciousness, but the probabilities are, that the anæsthetics now in use will not be displaced.

Discussion seems to have ceased as to the mode of action of anæsthetics. Dr. Buxton alone takes up the subject at length, and considers the theories that they produce their effect: 1, by lessening oxidation of the tissues; 2, by causing changes in the blood akin to carbonic acid poisoning; 3, by causing anæmia of the brain. None of these is tenable, and he falls back upon the only possible explanation—some change in the minute structure or processes of the nervous system.

> "We, therefore, have to fall back upon one hypothesis which formulates that the action of this group [the carbon compounds] of anæsthetics is one exerted upon the nervous system itself. To this view a rider will have to be appended, to the effect that this action is one which falls upon the protoplasm of the nervous and of the muscular systems."

All other theories of the action of anæsthetics were disposed of, and this same conclusion arrived at, by Claude Bernard,[1] more than ten years ago. Although this author is quoted by Dr. Buxton, nothing is said as to his explanation of the nature of the action, which was that it "is a semi-coagulation of the intimate constituents of the nervous cells," a theory which does not break down before the fact that the move-

[1] Leçons sur les Anæsthesiques, etc., Paris, 1875.

ments of the sensitive plant, where no nervous system exists, can be arrested by chloroform. Leave out the word "nervous," and the application holds good. However, knowledge as to the particular change, whatever it may be, is of no practical importance.

We find in these papers a general expression of the opinion that all anæsthetics are dangerous. There is no dissenting voice. Dr. Buxton says:

"In summing up the case of various members of the carbon series in which chlorine occurs, I think we must admit that, as far as the evidence is now before us, they are all dangerous anæsthetics."

Mr. Chiene says: "I am of opinion that no form of anæsthesia is safe, and to aim at obtaining an absolutely safe anæsthetic is to follow a shadow." Mr. Gunn, in the debate, says: "A perfectly safe anæsthetic had not been found, nor was it likely ever to be obtained." This may seem a small matter to comment upon, and so it is when the physiology of profound anæsthesia is alone considered, but it is far from being so in view of the partisanship which has prevailed, and which is still sometimes indulged in, as to particular anæsthetics. There is no agent used which merits the distinction of being the *only* safe anæsthetic. Let those who have claimed this for ether make a note. Moreover, there is a practical bearing of the fact well put by Mr. Chiene: "There is danger in lauding any anæsthetic as safe; it will certainly make the average administrator careless."

The next and very important observation is that the great danger of partial anæsthesia seems at last to have received due recognition. It is admitted by nearly all, and it is stated by one, who is not far from the truth, to be "the worst thing possible." Clearness of understanding of the mode of death, when it follows the surgeon's first incision under partial anæsthesia, is not promoted by saying that the death is by "shock," or by "syncope." Nevertheless, an appreciation of the great clinical fact and its practical value, is of the first importance. Looking back over the history of anæsthesia, it is astonishing to see how slow the profession has been in giving general acceptance to so important a point. Worked out experimentally by Lallemand and Perrin,[1] recognized and impressed by Richardson,[2] presented to and urged upon the profession of this country by the writer as early as 1867,[3] it has never until now assumed the prominence it deserves. Yet clinical experience has, unfortunately, given but too many illustrative examples. Over and over again death has followed instantly upon extraction of a tooth. Forty per cent. of deaths have taken place when the anæsthetic was given for a minor operation. A large proportion of these find their explanation only in this way. Now that this reflex mode of death is recognized in standard works on materia medica,[4] there will be no further question as to it. Dr. Brunton, however, explains the fact that imperfect anæsthesia is so dangerous, by saying that "chloroform does not paralyze all the reflexes at the same time." Claude Bernard says that in the early stages of chloroform administration the reflex actions are *increased*. We do not consider it yet established that under ether this mode of death is equally likely to

[1] Traité d'Anæsthesie Chirurgicale, Paris, 1863
[2] Med. Times and Gaz., 1870.
[3] This Journal, January and October of that year.
[4] Brunton's Pharmacology, Phila., 1885.

occur. Still, caution is the best safeguard. The ultimate action of all anæsthetics is probably the same. In the language of Bernard, there are many anæsthetics, but only one anæsthesia.

We unhesitatingly accord to Dr. Murray the credit of furnishing the most considerable and the best addition to our knowledge of the subject of anæsthesia to be found in these papers. Engaged in a series of experiments on the action of the uterus in rabbits, some modifications of respiration under chloroform forced themselves upon his attention. He observed that the movements of respiration may continue normal as to rhythm and depth, and yet no air enter or leave the chest. The chloroform was administered through a tube introduced into the trachea and the air-current registered by a recorder. The failure of the recorder to move was observed in five different cases, and the cessation extended in one case to twenty-eight seconds. All points of deception having been investigated, the conclusion given above was forced. Dr. Murray's explanation of this occurrence is that it arises from a failure of coördination of the muscles of respiration; that their rhythmic action is disturbed, as is the faculty of speech by the influence of alcohol, producing what may be termed a "respiratory stammer."

"Thus it might come about through the action of the anæsthetic on the centre of respiration, that the action of the diaphragm might be antagonized by the muscles of respiration, and *vice versâ*."

Dr. Murray further observed that when the recorder ceased to register an air-current, if a sudden afferent impulse were given, as by pinching the eyelids, it immediately recommenced work, showing that normal respiration was resumed. This brings us to the practical application which he makes. Sudden cessation of respiration in the human subject is generally explained by supposing that the tongue falls back on the glottis, obstructing the passage, and by pulling the tongue forward the patient is saved. This is doubted. The position is taken, with diffidence, that in many of these cases the falling backward of the tongue had nothing to do with the cessation of respiration, which, instead of depending on local causes was central, instead of being mechanical was vital. The relief which follows pulling forward the tongue depends then, in some cases at least, upon a reflex influence exerted upon the respiratory centre, similar to that which pinching the eyelids effects, and not upon mechanically opening the glottis. Now it is curious to note that Dr. Murray does not mention any authority in connection with this theory of restoration, he seems to have reached it directly from observation of his own experiments. But Lister[1] taught this doctrine fully and clearly; he both called in question the falling back of the tongue, and maintained the reflex influence exerted by pulling it forward. Mr. Chiene, in his paper, agrees with Dr. Murray. He says that he is inclined now to lay greater stress upon the reflex influence of pulling out the tongue than he formerly did, although he does not entirely abandon the mechanical theory. Finally, the theory of this reflex influence finds strong confirmatory support from the progressive march of chloroform anæsthesia. The mucous membrane of the throat and larynx is the last refuge of departing sensibility.[2] Based upon this fact, even before 1863, Jules Guèrin advocated cauterization of the pharynx as a means of combating the accidents of anæsthesia.

[1] Holmes's System of Surgery, art. Chloroform. [2] Lallemand et Perrin, op. cit.

All that Dr. Murray has written here upon the resuscitation of animals when respiration has ceased, should be read. It is highly interesting, and there is a further practical application. He is undoubtedly right in the assumption that the effect of the first inspirations made is to carry more chloroform into the blood and thus seal the fate of the patient; and that, therefore, the first effort should be to withdraw from the air-passages the air saturated with vapor. While it is entirely impracticable to follow out his suggestion, to carry a tube, which, in case of accident, is to be passed into the glottis, we think his teaching worthy of being kept constantly in mind by every administrator. He should satisfy himself that air passes in and out of the chest, as well as that the respiratory muscles move, and that in efforts to restore the patient when in danger, expiration should precede inspiration. We may add, too, that the administrator of chloroform should never fail to hold in mind the residual air of the respiratory process.

The mode of death from anæsthetics equals, if it does not transcend, in interest and importance, any other point connected with the subject. We are glad to find here a general recognition of the fact, that there is more than one way by which these agents prove fatal. No one thing, in our opinion, has retarded progress so much as want of recognition of this fact. There have been two great errors in the past as to this point: first, an obstinate adhesion to some particular mode of death; second, a too rigid application of the results produced in animals to man. They have not yet entirely disappeared, for there are traces of them even here. Thus, Dr. Murray says "chloroform is primarily a respiratory poison, and if given in sufficient quantity it stops the action of the respiratory centre before it affects the heart." The proposition is true if limited to animals, but it can be broken down in a moment by clinical evidence. If this were matter of theory alone it would not merit attention, but theories in regard to the mode of death have direct practical bearings of the utmost consequence. From theories have been derived those sententious expressions which have influenced practice, as do all dogmatic expressions, and influenced it for evil. "Give a dose of spirits before administration and your patient is safe." "Never mind the pulse—watch only the respiration," etc. The long continuance of error upon this point can only be explained by the facts, that it has been given to no one man to see and compare many deaths, and that there have never been spread before the profession the collected deaths so that they could be studied and compared. In this country the deaths were classified as early as 1867,[1] and an attempt made to impress upon the profession the importance of recognition of the fact that they differ widely in character. Nothing can be more striking to any one who will carefully study anæsthetic deaths, than the different period of the process at which, and the different manner in which, the subjects died.

Dr. Buxton's paper is the fullest upon this point. He recognizes reflex death by chloroform of two forms. The first is when the impression comes from the surgeon's knife in a state of partial anæsthesia, which has been already considered. In the second the impression is upon the terminal branches of the vagi in the lungs, or upon the laryngeal nerves, reflected upon the heart and suddenly inhibiting its action. This doctrine was first taught by Dr. Bigelow, of Boston, as early as

[1] This Journal, October No.

1848,[1] then by Brown-Séquard in his lectures on the physiology of the central nervous system, and has been repeatedly urged upon the profession in this country since. It is sustained by the experimental observations of Rutherford,[2] upon the effect of irritating vapor, as ammonia, applied to the nose of anæsthetized animals, and especially by the observations of the Anæsthetic Committee of the British Association[3] as to the sudden and very considerable diminution of the blood-pressure upon every application of a fresh supply of chloroform to the sponge. Recognition of this mode of death is of the first practical importance as to administration. Case after case in the clinical records can be pointed out, in which death followed instantly upon pouring out a new supply of the liquid, or upon the patient drawing a deep inspiration.

As there are two forms of reflex death, so there are two forms of direct death—*i. e.*, death produced by direct action of the agent on the nervous centre of either the respiratory or the circulatory systems. Illustrations of both these can be found in any collection of deaths; sometimes respiration has ceased first, sometimes cardiac action stopped suddenly while the breathing continued for a time. Both these forms are recognized by Dr. Murray.

Besides these modes of death, together with that from obstructed respiration, either by spasm of the glottis, falling back of the tongue, or incoördination of the respiratory muscles, as already considered, Dr. Buxton is inclined to accept another, caused by direct action of chloroform upon the muscular structure of the heart. The question of this mode of death was considered by Koch,[4] by Kappeler,[5] and by Richardson. All have decided in favor of the view that the influence is exerted rather upon the cardiac ganglia than upon the muscular structure. It would seem impossible to say what particular tissue is affected when chloroform is blown on the heart of an animal and its action thereby restrained or stopped. All analogy, together with the marked preference, or elective affinity, of chloroform for the nervous system, would seem to sustain the opinion of these authorities. Dr. Buxton, however, thinks the effect is exerted upon the protoplasm:

"Chloroform is certainly inimical to protoplasm at the least in a higher degree than is ether." "There seems to me no doubt at all that chloroform is a powerful protoplasm poison, and as such its use must be fraught with danger."

As to modes of death from ether, Dr. Buxton recognizes, first, that from spasm of the glottis, "so rare as to be practically unimportant, save as a means of pointing a moral." Second, that by causing bronchitis, pneumonia, etc. "That there is a considerable danger of these occurrences in the case of young and delicate children, I am pretty certain." It is the aged, we believe, who are peculiarly liable to a rapidly fatal suffocative catarrh after ether, although full references cannot now be given.[6] Mr. Chiene mentions a death the day after the operation from severe bronchial symptoms, and in his opinion due to the ether, but he does not give the age of the patient. In the debate one speaker recognizes this danger. Then comes death by paralysis of the respiratory centre, and claimed by those who carry their advocacy of ether to par-

[1] Transac. Amer. Med. Assoc., Vol. I.
[2] Journ. of Anat. and Phys., May, 1869.
[3] British Med. Journ., 1879.
[4] Klinische Vorträge, No. 80.
[5] Anæsthetica. Lief. xx. der Deutschen Chirurgie, Stuttgart, 1880.
[6] Bichet, Accidents tardifs apres l'administration d'anæsthesiques, Gaz. des Hôpitaux, July, 1879.

tisanship, to be the only mode of death from this agent. Dr. Buxton admits another, the same mode as that in which chloroform frequently proves fatal, a death by paralysis of the circulatory centre, for so we interpret the term "syncope." This form, he says, is rare, much rarer than with chloroform, which is certainly true. But it is very singular to see that Dr. Buxton having admitted this form of death, hastens to throw doubt on it! "It is probably doubtful whether these cases are due to ether-inhalation; as we shall see, the heart is practically uninfluenced for evil by ether." True, if there be added "*in animals*," but it is not true in man. Dr. Buxton says: "The action of ether upon the vasomotor system has been carefully worked out. Arterial pressure is always increased in ether-narcosis." But Kappeler says the reverse, and his observations were made upon man. In seven of ten sphygmographic tracings, "the curve of deep ether-narcosis differed not at all from that of chloroform-narcosis,"[1] and his conclusion from clinical study was that death in man under ether does not always begin with the respiratory process, and that ether-death does not differ essentially, in some cases, from chloroform-death. Ether-death by cardiac paralysis is distinctly recognized by Mr. Clover,[2] an authority which will certainly be accepted anywhere. This form of death is the exception, it is true, with ether, while it is frequent with chloroform.

There remains now to note some points not mentioned at all, or which do not receive the attention they deserve, even in papers not designed to be exhaustive. There is no observation or remark as to those fatal cases in which the dangerous symptoms make their appearance some considerable time after the administration of the anæsthetic has ceased. Such cases there are on record, after both ether and chloroform; and with our present knowledge they baffle all attempts at explanation, and offer an interesting and complex problem for solution.

There is not the slightest allusion here, in papers or debate, to the important fact, first recognized by Dr. Emmet, that a patient with albuminuria is a peculiarly bad subject for ether. The point is one of so great practical importance that it is singular not to find it in a canvass of the dangers of anæsthetics.

We looked with interest for, and think there was right to expect, something here as to the relative use of the two great anæsthetic agents, and as to their relative mortality in Great Britain. Some inference may be drawn, but there is no definite statement, and no statistics. Any one who reads a weekly British medical journal, cannot fail to be horrified by the frequently recurring announcement of a death from chloroform, nor to feel the deepest surprise that the profession there has not to a greater extent abandoned an agent which experiment and experience have both demonstrated to be far more dangerous than other anæsthetics at command. And still these papers and this debate show no marked disposition to change. The general tone is that ether is the safer anæsthetic. One would think that Dr. Buxton had made the dangers of chloroform pretty plain, yet in the very same paragraph in which he says that its use "is fraught with danger," he himself expresses the belief that it "is much maligned," which means, we suppose, that a good case has not been made out against it! Further, "as a practical anæsthetist myself, I should not hesitate in many conditions to administer

[1] Op. cit., pp. 158, 167.

[2] Quain's Dictionary, art. Anæsthetics.

chloroform, or a congener, rather than ether." The determining conditions he does not give. In the debate, we read that "all Scotch surgeons like chloroform, and it is the same among Scotchmen in London." Mr. Chiene is a Scotchman. After a death from chloroform in his wards he used ether for a year, and then returned to chloroform. Now he makes a bold plea for his agent. He says:

"The present outcry against chloroform is the result of an imperfect understanding of A, its physiological action; B, the proper method of administration; C, the dangers which may accompany its use, and their treatment; D, the dangers which follows its abuse, and their treatment."

If any one could transport himself back to the time Mr. Chiene's lecture was written, he might accept the professional feeling against chloroform as a mere "outcry;" with eyes open in the present, it is impossible not to see that our understanding of most of these points is far from imperfect. Prof. Fraser, in the debate, boldly stated his disbelief of "the difference alleged to exist in the relative mortality of chloroform and ether." And "nothing he had ever heard would lead him to believe that ether was distinctly preferable to chloroform." Prof. Fraser is an eminent teacher of materia medica, and lives in Edinburgh. With statistics now before the profession his position is astounding, but we can appreciate the point he makes that the use of ether, "only now commencing to extend" in Great Britain, the near future may show a different footing of the figures. It is precisely in the lack of statistics upon this point that the greatest disappointment is experienced in reading these papers. For some years ether has been gaining upon chloroform as an anæsthetic in that country, and it is there that a solution of the problem of the relative mortality of the two great anæsthetic agents is to be looked for. Here Kappeler looked for it. In his work published six years ago, he pays a handsome tribute to the public institutions of Great Britain, to the publicity of their administration, to the enterprise and conscientiousness of its medical press, calls attention to the vast field there presented for observations of anæsthetics, indicates that to that country we must look for a solution of this yet unsolved problem. The solution has not yet been furnished.

Finally, as to the relative danger of the two agents, ether and chloroform, we fail to find here a recognition of that one great point which should alone decide the question. That point is the irregularity of action of chloroform—the fact that it does not always act in the same subject in the same manner. To show that this is a fact we could quote abundant testimony, both practical and theoretical, but there is enough emanating from Great Britain alone. Clover recognized the irregularity of action of this anæsthetic and abandoned it. Anstie indicated it. Richardson says that chloroform shows "deviations of the usual order in which the various functions of the nervous system are affected." But nowhere is this point more prominently stated than in the report of the Anæsthetic Committee of the British Medical Association, and published in its own journal.[1] Chloroform acts so differently upon the same animal at different times, that this Committee is obliged to strain language and use a word which implies volition to express it—"chloroform has sometimes an unexpected and *capricious* effect on the action of the heart!"

[1] June 29, 1879.

It is this fact that has justly banished chloroform from general use as an anæsthetic; by this fact alone can it be explained that chloroform has caused death under all circumstances, in spite of the most minute precautions, and in the hands of the most skilful administrators, such as Snow, and Clover, and Kappeler. Yet this fact seems yet unrecognized by the profession of our sister country.

With hesitation to accept ether, and a recognition of the dangers of chloroform, we find no effort to escape the dilemma by resorting to mixtures. They receive very little mention. One speaker alone has lately used the A. C. E. mixture—one part alcohol, two parts chloroform, three parts ether, by measure. All he can say of it, is that he has found it "a very useful preparation." Another gravely asks what is the object of the mixture, and another says that all the ether will evaporate and leave only chloroform "*in a week!*" Doubtless he has been misreported. Mr. Baily, of London, is in the habit of giving four parts of ether to one of chloroform "in eye cases, and this did very well, too, in cases of ovariotomy and general surgery." But one surgeon has used mixed vapors systematically, and that has been by Clover's inhaler, giving first chloroform, and then turning on ether. Again we have to confess surprise. Mixtures were formally recommended by the Medico-Chirurgical Society of London as early as 1864; among the formulæ given was that of the A. C. E. mixture. Yet in the land of their birth they are scarcely recognized. It is impossible to frame an explanation. Mixtures are diluted chloroform. All experiments with animals have shown the importance of keeping down the percentage of chloroform vapor in the air, all inhalers have been designed to insure this, and we add that an immense clinical experience has been gathered in favor of simple dilution. There is the Vienna mixture, six parts of ether to two of chloroform, with more than 8000 administrations and no death; there is the weight of Billroth's authority in favor of three parts chloroform, one part ether, and one of alcohol; there is the valuable experience of Sir Spencer Wells, in favor of methylene, which is only diluted chloroform. Twenty years' experience with the A. C. E. mixture has given to the writer the firm assurance that this mixture is equally as safe as ether, while it is far more prompt in action and manageable during administration.

From these papers it appears that there has not been in Great Britain any considerable experience with, and consequently that there is no just appreciation of the value of, the combined influence of morphia and atropia, in modifying the action of anæsthetics, and in warding off their dangers. The practice of giving a preceding hypodermic injection of these narcotics is resorted to by few, its advantages are questioned by some, and but faint praise is given it by any. One speaker deems it "advisable" where shock is anticipated, or where the condition of the patient demands it—the particular condition not being stated. Another thought that "the administration of morphia undoubtedly possessed some advantages, as in avoiding shock; but the resulting narcosis was often very prolonged, and might cause alarm," which may be true, but depends entirely on the amount of the dose. Prof. Fraser "raised the question as to whether the administration of morphia and atropia beforehand was really of practical value." Mr. Chiene alone follows this plan regularly, and has done so ever since he resumed the use of chloroform. He, however, expresses no strong convictions in its favor. We trust that the history of this important modification of the anæsthetic process is better

known in Europe than is indicated here. Mr. Chiene's "attention was directed to it by his house surgeon," and, "he learned it from Prof. Fraser's lecture." Surely Nussbaum and Bernard, who, in 1863, almost simultaneously discovered it, deserved mention, and especially the latter, who, in 1875,[1] gave to the world the experimental proof of the benefits to be derived from it. Just across the channel, theses and treatises have appeared upon the subject,[2] and ten years ago it was formally advocated in America.[3]

When we examine this mode of practice theoretically, we cannot but be astonished at the amount of favorable evidence which immediately presents itself. Anæsthetics produce death in various ways, the most frequent of which is by depression of the circulatory or respiratory powers; one or both of these fail more or less suddenly. Chloroform frequently causes death by a profound impression on the laryngeal and pulmonary, or on sensitive nerves, thus by reflex action, inhibiting the heart. Could we eliminate from the action of chloroform depression of the heart's action, and deleterious reflex influence, it would stand to-day without a rival as an anæsthetic. The only question remaining then is, whether we have any drugs which will stimulate and sustain cardiac and respiratory power and restrain reflex action. The question needs no answer. It is in every treatise on materia medica. The power of atropia as a stimulator of the two great vital functions has been emphasized by Harley, and Bartholow, and Fothergill, while the soothing and shielding influence of morphia against all irritations needs no mention. And now comes Lauder Brunton to add abundant testimony of the strongest character in support of this modification of the anæsthetic process.[4]

It is curious to see Dr. Buxton come right up to a recognition of the necessity of something of this kind and then pass on without mentioning it. He asks "if we may not so administer our chloroform as to obviate all possible risk of reflex syncope through stimulation of the vagal endings," and gives no answer to the question.

When it comes to clinical support, there is a great deal in favor of this mixed anæsthesia, besides that given in the authorities mentioned, and we know of none adverse. Personal experience with it has been extensive enough and varied enough to impress the strongest convictions. Nor is it in a single direction that benefit is derived. First, there is the emotional disturbance quieted, and there have undoubtedly been deaths purely emotional from dread of the anæsthetic, just as there were such deaths from dread of the operation before anæsthetics were known. Then there is the small quantity of anæsthetic required to produce and to maintain surgical anæsthesia. Again, there is the greater quietude of the patient from the more profound effect. Bernard could tie the lingual artery of the dog, deep in the throat, under the united effects of chloroform and narcotics, but could not do it with either alone. We have seen the method tried with the same anæsthetic (A. C. E.), by the same administrator, to the same patient, and for the same operation, and

[1] Leçons sur les Anesthesiques, Paris.
[2] De l'anesthesie mixte, etc Par Verriet-Litardiere, Paris, 1878. Recherches sur l'anesthesie chirurgicale obtenu par l'action combinée de la morphine et du chloroform. Par H. de Brinon, Paris, 1878.
[3] This Journal, April, 1876.
[4] Pharmacology, Phila., 1885.
"Belladonna and stramonium have a rather peculiar action, stimulating the respiratory centre, and at the same time appearing to lessen the excitability of the ends of the vagi in the lungs"—p. 223
"This drug [atropia] completely destroys the inhibitory action of the vagus on the heart"—p. 252.
"These two classes [among them is atropia] agree in destroying the inhibitory power of the vagus nerve."

have been both surprised and pleased at the contrast. Over and over again we have seen patients go through ovariotomy without pulse or respiration wavering, and Richardson pointed out the marked reflex effect of thrusting a sponge into the peritoneal cavity. Over and over again we have seen them pass through this operation without moving a muscle or uttering a sound. We have seen them strapped down to the table in England. Then after the operation with this plan, hours are spent in quiet slumber and the after-sickness of the anæsthesia is lessened, because, as a general rule, it is in direct proportion to the quantity of the anæsthetic absorbed. These advantages are all independent of the question of danger, and that none of them have attracted sufficient attention to cause notice is passing strange. Stranger still, and a more striking proof of the entire want of appreciation of this method in Great Britain, is the fact that it is not mentioned in the paper of Dr. Talfourd Jones, read at the same meeting, on Hypodermic Medication.[1] Formal consideration is given in this paper to the antagonism of medicines, and full recognition of the powers of morphia and atropia as cardiac and respiratory stimulants, and yet their effect in counteracting the depressing effect of chloroform on the heart is not mentioned.

In closing, we feel compelled to notice some points of doctrine to which we cannot give assent. They are all in Mr. Chiene's paper. This gentleman occupies a high position as a teacher, and enjoys an enviable reputation as a surgeon. Yet these facts but render the duty more imperative of combating doctrines which may mislead young practitioners and are fraught with danger to the patient. We will not oppose to any one of these mere theoretical disquisitions, but present the irrefragable evidence of clinical experience.

In his paper we read, in regard to the administration of chloroform, "No attention is to be paid to the pulse; it is the last thing that stops." In this he follows his predecessor, Lister, who did not hesitate to say that to consider the pulse the most important symptom "is a most serious mistake."[2] Now, in reply to this, it is not necessary to go beyond the first four cases of death, under chloroform, as given by Snow.[3] They were recognized as deaths by paralysis of the heart by Dr. Sibson, and commented on as such as early as 1848. "When the stoppage of the heart's action is due to the drug the patient is dead," says Mr. Chiene. This is true. But how about those cases seen over and over again where the heart's action failed and the patient was rescued? Dangerous symptoms, under anæsthetics, as well deserve study as cases of death. Of twenty-one cases of dangerous symptoms by Anstie, in sixteen a change in the pulse is most prominently noted, and, with pallor, was the first symptom observed.[4] In every work upon chloroform ever published, death beginning at the heart, has been made prominent under the various terms of "shock," "syncope," and "sideration," and clinical experience has furnished so many examples of this mode of death that it has been held by many to be typical of and peculiar to chloroform, and death by respiratory paralysis has been completely overshadowed. Yet we are told that it is a matter of no importance to watch the pulse!

Again, Mr. Chiene has some excellent remarks upon administration; that the administrator "must use his brains" is well put. But he says,

[1] British Med. Journ., Sept. 26, 1885.
[2] On Anæsthetics, London.
[3] Holmes's Surgery.
[4] Sansom, on Chloroform, pp. 87–89.

"it is a matter of no importance how much is poured on the towel, except as a matter of economy!" There is no more dangerous doctrine connected with the giving of chloroform than this. It is not necessary to go over again deaths from reflex action by powerful impressions on the laryngeal and bronchial nerves. Nor need we again refer to the report of the Grant Scientific Committee, and the observations of the sudden retardation of the heart's action upon every fresh application of chloroform to the sponge. But, clinically, what will Mr. Chiene do with Case II. of Snow's list? One such case is enough to settle the question; but of 133 fatal cases, 8 died immediately upon adding a new supply of chloroform to the sponge or apparatus![1] The clinical evidence is overwhelming.

We read further of "stoppage of the respiration and heart's action, directly due to a poisoning *by an overdose of the drug*." Again Mr. Chiene is true to the doctrines of the Edinburgh school, and continues an error which, in the expressive language of Kappeler,[2] runs like a scarlet thread through British anæsthetic literature. "Chloroform is a cumulative poison," Mr. Chiene says. How has it been shown? Of the fatal cases, fifty per cent. have died before the stage of surgical anæsthesia was reached.[3] In other words, when a patient is "off," under chloroform, one-half whatever danger there may be in the process is passed. Again, of Snow's fifty fatal cases, nine died within a minute after commencing to inhale, and four of these within a few seconds. These immense clinical facts must be disposed of by any one who maintains that chloroform is "cumulative," or kills only by overdose.

But there is another important aspect of this doctrine, a direct corollary of the premise. It throws the blame of every fatal accident most unjustly upon the administrator. This is plainly taught by Lister: chloroform "is deadly when mismanaged; is free from danger if properly used."[4] The proposition is monstrous. Deaths from maladministration there have been; they are easily recognized; but those who accept and maintain the proposition that all deaths are from "cumulative" effect, or overdose, and consequently from want of skill, or care in administration, must also accept the proposition that Simpson and Snow, and Clover and others, of the best administrators the world ever saw, killed their patients by malpractice.

The query will doubtless arise, how it is that, with so gross a violation of what we believe to be an essential point in the administration of chloroform—its slow and gradual introduction—the mortality does not illustrate it? To this may be adduced the very imperfect extent to which the experience of any individual can form a basis for the calculation of mortality. The figures seem "capricious!" Thus, Mr. Clover had 5000 cases without accident, and then two deaths close together. One hospital in England had one death in about five hundred administrations. Nussbaum has given it forty thousand times without a fatal result. Second, we find herein an additional argument in favor of mixed anæsthesia. Since Mr. Chiene has resumed chloroform, he precedes the administration by a hypodermic injection of morphia and atropia. It is the influence of these narcotics in sustaining the respiration and circulation, in benumbing reflex sensibility, in harmonizing actions of the

[1] See Lallemand and Perrin, Cases 11, 12, 16, 18, 26, 35, 40, 47, 66.
[2] Op. cit. [3] Sansom.
[4] Holmes's Surgery.

nervous system thrown into discord as anæsthesia is produced, which enables the patient to pass safely through even the dangers of maladministration. And we do not feel at all certain that if the more extended use of ether should show any considerable increase of mortality, that the anæsthetic of the future will not be chloroform with a preliminary injection of narcotics. J. C. R.

MICRO-CHEMISTRY OF POISONS, INCLUDING THEIR PHYSIOLOGICAL, PATHOLOGICAL, AND LEGAL RELATIONS; WITH AN APPENDIX ON THE DETECTION AND MICROSCOPIC DISCRIMINATION OF BLOOD. Adapted to the use of the Medical Jurist, Physician, and General Chemist. By THEODORE G. WORMLEY, M.D., Ph.D., LL.D., Professor of Chemistry and Toxicology in the Medical Department of the University of Pennsylvania. Second edition. 8vo. pp. 784. Philadelphia: J. B. Lippincott Company, 1885.

THE second edition of Professor Wormley's well-known treatise contains some valuable additions, but the scope and design remain unchanged. The most important of the additions, we are told in the preface, consist of illustrative cases, new tests and methods, and an appendix on the discrimination of blood. Numberless other improvements are, however, to be found in the text.

It may be said at once that the book is invaluable, and, indeed, absolutely essential to every toxicologist. It is no mere *rechauffé* of the labors of others, but is crowded with records of the personal work of the author, work which was much wanted, which required great patience as well as skill for its execution, and for which every scientific man must feel grateful. So great indeed is the value of the book, that the reviewer feels tempted to speak only of its merits and to ignore its defects. But it is necessary to say that it is very incomplete. It should have been smaller, or much larger, and in either case its practical utility would have been enhanced. The author might have confined himself to the subjects indicated by his title, and given us, with his admirable microscopic drawings, a complete account of the uses of the microscope in toxicology, and of limits of delicacy in chemical tests. Or, conferring a still greater boon, he might, as he evidently could, have made the book a complete manual of toxicology. As it is, the deficiencies are as obvious as its merits. Many poisons of great importance are omitted altogether, and many details with regard to other poisons which should appear in a complete treatise are absent. On the other hand, space might have been saved by the curtailment of purely chemical descriptions found in every text-book; as, for instance, in the pages devoted to the chemical properties of sulphuric acid and phosphorus. Among the omissions, we find poisons as important as the barium and chromium compounds, carbolic acid, nitro-benzene, chloral, colchicum, cantharides, ergot, savin, and croton, not to speak of the paraffins and terpines. In regard to several of these poisons, Professor Wormley's careful observations would have been very useful.

The introductory section of the book deals, as usual, with definitions, classifications, sources of evidence, general methods, and the like. It

seems to present no particular points of novelty. The classification adopted into irritants, narcotics, and narcotico-irritants, is by no means perfect, but is perhaps as good as any other. An interesting case illustrating the effect of opium and quinine in delaying the action of strychnine is given on page 39. Although three grains of strychnine were taken, no serious effects followed for twelve hours, and death only occurred after forty hours. In this case one drachm of opium and an unknown quantity of quinine had been taken with the strychnine.

Part I. is devoted to inorganic poisons, the mineral acids and alkalies, oxalic acid, hydrocyanic acid, phosphorus, antimony, arsenic, mercury, lead, copper, and zinc. Throughout this part, and, indeed, throughout the book, the most remarkable and useful features are the careful determinations of the limits of delicacy of each test and the illustrative plates showing the appearance under the microscope of the most important precipitates. The system adopted in determining the limit of delicacy is illustrated in the first case that occurs, the action of platinic chloride on potassium chloride (weighed as oxide). In a series of experiments, single grains of water contained $\frac{1}{50}$th, $\frac{1}{100}$th, $\frac{1}{250}$th, and $\frac{1}{500}$th of a grain of K_2O as chloride, and each was treated with platinic chloride. Even in the last case a good precipitate formed in three-quarters of an hour. With barium chloride $\frac{1}{40000}$th of a grain of sulphuric acid, and with brucine $\frac{1}{50000}$th of a grain of nitric acid were detected, the test in the last case being made in a white porcelain dish. It is also recorded that $\frac{1}{10000}$th of a grain of oxalic acid gives satisfactory crystals, visible under the microscope, when evaporated on a slide.

The section on hydrocyanic acid is, on the whole, a good one, although its value is diminished by one or two serious omissions. Many interesting cases are recorded, of which not a few are from American sources. The comparative delicacy of the silver, iron, and sulphur tests, as applied both to solutions and to vapor, are compared with care. Solutions of the poison in one grain of water gave the following results, in fractions of a grain:

	In solution.	As vapor.
By silver was detected	$\frac{1}{500}$	$\frac{1}{100000}$
By iron was detected	$\frac{1}{10000}$	$\frac{1}{50000}$
By sulphur was detected	$\frac{1}{25000}$	$\frac{1}{10000}$

The silver test is much the most delicate, and even in solution $\frac{1}{500000}$th of a grain can be detected, but the author does not consider the proof complete unless cyanogen is actually detected on ignition. The omissions referred to above are: first, that the quantitative estimation of the acid by standard silver nitrate is not noticed, although it is very delicate and satisfactory; and, secondly, that there is no mention of essential oil of bitter almonds. The last omission is a serious one, for the crude essential oil contains, as is well known, large and variable amounts of hydrocyanic acid, and instances of poisoning by it are by no means rare. In a somewhat recent case one drachm of the crude oil, taken internally, proved fatal in an hour and a half, and it was found afterwards that not less than one grain of hydrocyanic acid was contained in the oil. The separation both of oil and acid from the contents of the stomach is easily effected. The matters, mixed with water, are rendered faintly alkaline with potash and distilled. The oil distils with the water, and can readily be identified by its smell and by its spontaneous oxidation into benzoic acid. Hippuric acid is, moreover, found

in the urine in abnormal quantity. When the oil has passed over, the flask is cooled, the contents slightly acidulated and warmed in a stream of air, the hydrocyanic acid which is now evolved being received in a series of small bulbs containing a solution of potash. The detection and estimation of the acid are then, of course, easy.

The section on arsenic is one of the best in the book. Here the valuation of the tests is most excellent and the manipulations necessary for the utmost accuracy are described with great lucidity. Almost the whole of the analytical and descriptive portions deserves reproduction, and will repay attentive study. There is, to begin with, an experimental study of the solubility in water of the different varieties of white arsenic, which serves to account for the discrepancies of previous observers, although it does not explain the variations, which, indeed, are enormous. Probably definite and even, perhaps, isomeric hydrates exist which have different solubilities. The experiments would have had even greater value if the temperature at which they were made had been recorded.

Still more important is the account of Reinsch's test, which is more commonly used than any other. Its limits of delicacy are defined as follows: In each case one grain of solution containing various quantities of white arsenic was used, and a fragment of pure bright copper foil measuring $\frac{1}{10}$th by $\frac{1}{20}$th of an inch heated in it, in a thin watch-glass, after acidulation with pure hydrochloric acid. When the solution contained $\frac{1}{50000}$th of a grain of white arsenic a distinct deposit was obtained, but with $\frac{1}{100000}$th of a grain only a very slight tarnish. In the former case the copper, heated in a minute capillary retort, yielded in some cases as many as fifty crystals in each field of the microscope, each crystal well marked in form, and each measuring from the $\frac{1}{3000}$th to the $\frac{1}{10000}$th of an inch in diameter. Crystals of $\frac{1}{5000}$th of an inch diameter do not weigh more than $\frac{1}{2000000000}$th of a grain! With sulphuretted hydrogen $\frac{1}{10000}$th of a grain of white arsenic can be detected. The silver and copper tests are much less delicate. Marsh's test, on the contrary, is marvellously sensitive when the evolved gas is decomposed by heat. In one experiment $\frac{1}{50000}$th of a grain of white arsenic was detected in the presence of 5,000,000 parts of liquid. Professor Wormley doubts whether any other test known to chemistry is as delicate. Some valuable notes on the occurrence of arsenic in glass, confirmatory of the results of Dr. W. Fresenius, are appended; and also some recent cases illustrative of the admitted fact that arsenic may become diffused throughout a body when introduced *post mortem*.

The copper test for mercury is not less delicate than for arsenic. The manipulation is the same. The minute fragment of copper is heated in the same capillary retort, which need not be more than two inches long, and the beads of mercury are detected and measured by the microscope. In an extreme case $\frac{1}{500000}$th of a grain of corrosive sublimate yielded 20 mercurial globules varying in diameter from $\frac{1}{3000}$th to $\frac{1}{10000}$th of an inch. Much smaller globules can be measured on a flat surface, and with an eighth power a globule measuring $\frac{1}{25000}$th of an inch in diameter and weighing only $\frac{1}{300000000000}$th of a grain is visible. But as to the practical separation of mercury, it is found that "even under the most favorable conditions the least quantity of corrosive sublimate from which the mercury can thus be reproduced is about $\frac{1}{100000}$th, or at least $\frac{1}{500000}$th of a grain." It is to be regretted that no information is given as to the toxic action of some other mercury compounds beside corrosive

sublimate. We should have been glad of the latest opinions as to the injurious action of the subchloride, the sulphite, and white precipitate. Professor Attfield found that vermilion is so inert that it can scarcely be classed among poisons, a fact of no little importance, considering how constantly it is used as a pigment.

Lead, copper, and zinc follow mercury in order of treatment. On the whole, there is little in regard to them which calls for comment. In regard to copper, it may be remarked that it is still doubtful whether its continued use in small quantities can be considered as poisonous. The question is very important, for it is notorious that copper salts have often been used to impart an attractive green color to preserve provisions, and public analysts have often been called upon to express an opinion whether a minute addition of this kind constitutes an adulteration "injurious to health." The fact that a large dose of blue vitriol is poisonous proves no more than that a similar dose of saltpetre has been known to be deadly, which no one doubts. But as to the "frequently repeated small doses" there is yet but imperfect evidence. No one seems to know what the small doses have been.

In this, as in some other parts of the book, the quantitative methods described are decidedly inferior to the qualitative. There is only one satisfactory way in which to estimate copper in an organic mixture. The mixture must be burnt completely to actual ash. Incineration to charcoal is insufficient, for the charcoal holds some of the copper with tenacity. Then the ash, dissolved in dilute sulphuric acid, filtered, and, if necessary, concentrated, must be placed in a weighed platinum basin, and either treated with pure zinc, or exposed to a voltaic current with the platinum for negative electrode. In either case the copper will adhere to the platinum, which may then be washed, dried, and reweighed.

The second part of the book is occupied exclusively with vegetable poisons, or, to be accurate, with a certain number of the more important alkaloids and the vegetable substances from which they are derived. As a matter of course, the introduction describes the various general methods by which the poisons are isolated with a view to their individual detection, and equally, as a matter of course, the method of Stas, with its subsequent modifications by Otto and others, stands first. In the main, it is an excellent process, and the systematic detection of alkaloidal poisons may be said to date from the time, 1851, when Stas's memoirs appeared. Otto's modification, which is in many cases a distinct improvement, consists, as is well known, in removing, by means of ether, fat and other substances from the acid salt of the alkaloid before the separation of the alkaloid itself. For the subsequent isolation of the alkaloid, chloroform is a more generally useful solvent than ether. In the case of morphine, amyl alcohol is a better solvent than ether. The charcoal process of Graham and Hofmann, and the interesting dialytic method of the former chemist, from which so much was once expected, are properly dismissed as inadequate for modern requirements. The great objection to dialysis is the imperfection of the septum. Fine animal membrane gives much better results than vegetable parchment, and it is not impossible that even yet some practical good to toxicology may come of dialysis. Hitherto, however, it has been practically useless.

Of much greater interest at the present time is the ingenious system devised by Dragendorff, by which mixed alkaloids and some other allied substances can be separated from one another. The substance to be ex-

amined is acidulated with sulphuric acid and extracted with water. The evaporated aqueous extract is extracted with alcohol at a low temperature, and the alcohol distilled off. The concentrated acid extract is then treated, successively, with petroleum, ether, benzene, and chloroform; it is then rendered alkaline by ammonia, and again treated in turn with petroleum ether, benzene, chloroform, and amyl alcohol, which last removes morphine and some other substances which are supposed to have been left untouched in the previous operations.

Now, this system of Dragendorff's is easy to criticise, and it is impossible to deny the truth of some of the objections which Professor Wormley and others have pointed out. It is true that "few, if any, of the bodies are wholly insoluble in the different extracting fluids employed," and also that the evaporation with sulphuric acid is objectionable, but none the less it is valuable, not only as the first attempt at the systematic separation of alkaloids, but also, and much more, as affording a kind of synopsis of separative methods. That it does not enable us to analyze perfectly a mixture containing a dozen different proximate principles, some of which are present in very minute quantity, must be freely admitted, but such cases do not often occur, and when they do, we have no better method to fall back upon.

The poisons described in the succeeding pages are nearly all well known, and are sufficiently indicated by the titles of the six chapters. These are: Volatile alkaloids (nicotine, conine); Opium; Nux vomica; Aconitine; Atropine and Daturine; Veratrine, Vervine, and Solanine; and Gelsemine. The deficiencies of this list are obvious, and it must be hoped that, at any rate, the more important omissions will be rectified in the next edition, which will certainly be wanted before long. The history, as far as it goes, is good. A great many cases are quoted which will be requoted in future trials, and the tests recommended have, in the great majority of cases, been subjected to careful personal trial by the author. The section devoted to strychnine is a good sample of the whole. The limit of delicacy of the well-known bichromate test is thus stated: $\frac{1}{100000}$th of a grain of the alkaloid is easily detected, and if due care be taken to concentrate the solution on one point of the basin, and to add the bichromate suddenly and in very minute quantity to that point, previously touched with sulphuric acid, an even smaller quantity can be found.

In Chapter IV. nearly twenty pages are devoted to aconitine, which, since the Lamson trial, has been very interesting. Some account, but not a very full or perfect one, is given of Dr. Wright's researches. No satisfactory chemical test for the alkaloid has as yet been obtained.

The chapter on gelsemium, added in the new edition, possesses additional interest because Professor Wormley himself, in 1870, showed the nature of the active principle. The yellow jasmine (*gelsemium sempervirens*), and particularly the root bark of the plant, contain a very poisonous alkaloid called gelsemine, and a non-nitrogenous acid, gelsemic acid, which was at one time erroneously supposed to be æsculin. A decoction of the bark is rendered alkaline with ammonia, agitated with ether, and the ethereal extract carefully treated with hydrochloric acid, when the hydrochlorate of the alkaloid separates in characteristic crystals. By evaporation, the acid can then be obtained from the ethereal solution in tufts, which can be purified by crystallization from alcohol. Both the alkaloid and acid appear to be poisonous, the former

in an eminent degree. Fortunately, both are easily detected: the former by a bluish-green coloration, which is produced after treatment with nitric acid and spontaneous evaporation, and by a blue color produced, as in the strychnine test, by the action of sulphuric acid and potassium dichromate. From the author's description, however, it would appear that the latter reaction must be due to some impurity, for he tells us that it no longer occurs if the sulphuric acid has been warmed with the alkaloid, although the alkali itself is not destroyed (p. 695). The acid in the pure state, and, still more strongly, in alkaline solution, gives an intense blue fluorescence, which no doubt led to its being mistaken for æsculin. The acid requires 2912 parts of cold water for solution, but is soluble without change in sulphuric acid as well as in alcohol, ether, and chloroform. From the sulphuric solution, ammonia throws down the acid in crystalline needles very easy to identify. Professor Wormley gives a drawing of the crystals obtained by the addition of ammonia to a drop of solution containing only $\frac{1}{1000}$th of a grain of the acid. Altogether it appears that the secret poisoner had better avoid yellow jasmine.

With gelsemium the toxicological portion of the book ends; but in the new edition there is an appendix of forty pages on Blood: its composition, detection, and discrimination; which is important, not only for the epitome which it offers of our present knowledge, but also on account of the careful work which the author has accomplished in his own laboratory, and which is here fully described. In the following summary it will not be necessary in every case to distinguish between original observations and those of other workers.

After a general account of the nature and properties of blood in which the size and form of the corpuscles are slightly noticed, the action of water and reagents on red corpuscles is described, and the modern view in regard to the nature of those bodies explained. Unfortunately, neither here nor in the subsequent pages is the author able to solve that most important problem, the differentiation of human from other mammalian blood. It is well known that in man and all mammalia, except the camel tribe, the corpuscles are circular and non-nucleated. In the camel they are oval, but still non-nucleated; but in birds, reptiles, and fishes they have a distinct nucleus, are almost invariably oval, and are much larger. Then comes the question of identification of blood, which is discussed under the heads of chemical and optical tests, with a final section on the examination of dried blood.

Of the chemical tests enumerated, the only ones of practical importance are the well-known hæmin and guaiacum reactions. When the blood is in solution a drop is evaporated, mixed with a trace of common salt and a drop of acetic acid, and again evaporated and gently heated till it is reddish-brown. The mass then exhibits under the microscope crystals of hæmin (hydrochlorate of hæmatin, according to Hoppe-Seyler), which are very characteristic. The guaiacum is very delicate. The following case is recorded from the author's experience:

A piece of muslin one-tenth of an inch square, containing a moderate blood stain of ten years' standing, was macerated with a few drops of water for a few hours. The liquid, which had acquired only a faint reddish hue, was then decanted and evaporated spontaneously, when it left a smooth ring-like deposit of a faint reddish-yellow color. This, under the action of the test (fresh alcoholic tincture of guaiacum, followed by ethereal solution of hydrogen peroxide), immediately assumed a deep blue color. So, also, a

minute portion of a single thread of the soaked material immediately acquired a deep blue color on the application of the reagents" (page 10).

In a subsequent paragraph we are warned that the reagents should be added separately; that the guaiacum alone should produce no color; and that, after the addition of the hydrogen peroxide, the blue coloration should appear "very promptly."

The optical tests are described at length, and include, not only the spectroscopic examination, but also the measurement of corpuscles, about which so much has been written. The discoveries of Hoppe-Seyler and Stokes are first described, and also the Sorby micro-spectroscope. In one of Mr. Sorby's beautiful little barometer-tube cells it is very easy to get a distinct spectrum with a solution that contains only $\frac{1}{1000}$th part of its weight of recent blood. Mr. Sorby, indeed, obtained a faint spectrum from a single blood corpuscle. The methæmoglobin and hæmatin spectra, acid, alkaline, and reduced, are also described; and these, as well as the other blood-spectra, are illustrated by a chromo-lithograph. It would have been better if the absorption bands had also been given in wave-lengths. In the examination of blood stains, it is, of course, possible that hæmoglobin, methæmoglobin, or hæmatin may be found, any one of them being equally conclusive proof of the presence of blood. With a very minute spectrum of hæmoglobin we are advised to convert into hæmatin with citric acid and afterwards reduce with iron salt. In that way three characteristic spectra can be obtained. No mention is made of Dragendorff's proposal to use borax solution for the removal of blood stains. It has, however, much to recommend it.

Not less important than the spectroscopic tests, although, unfortunately, not so generally applicable, are measurements of the size of corpuscles. After describing the methods of preparing blood-clots, new and old, for the microscope, Professor Wormley discusses the limit of determining differences and the methods of microscopic measurement. For mounting the sample and obtaining an even distribution, he recommends the method of Professor Johnston, of Baltimore, which consists in dipping the ground end of one slide in the blood to be examined and drawing it obliquely along another or along a cover. In the latter case the cover will, of course, be placed on a clean glass slide. The mean size can only be calculated from the very laborious measurement of a great many corpuscles. In the first series described, 500 corpuscles of human blood were measured, with the following results:

385, or 77.0	per cent.,	were from	$\frac{1}{3077}$	to	$\frac{1}{3333}$	of	an	inch.
42, " 8.4	"	"	$\frac{1}{3333}$	"	$\frac{1}{3636}$	"	"	
20, " 4.0	"	"	$\frac{1}{3636}$	"	$\frac{1}{4000}$	"	"	
49, " 9.8	"	"	$\frac{1}{4000}$	"	$\frac{1}{2898}$	"	"	
4, " 0.8	"	"	$\frac{1}{2898}$	"	$\frac{1}{2817}$	"	"	

with an average of $\frac{1}{3333}$th of an inch. Two other series from different samples of blood gave results which are practically identical. Under certain circumstances the average sizes of the corpuscles may be slightly less than the above fraction, but they never increase.

Then follow tables in which the author's measurements of the corpuscles of various mammals, birds, reptiles, batrachians, and fishes are compared with those obtained in the classical researches of Gulliver. In very few cases is there any important difference, the most notable being with regard to the opossum. A very useful microscopic chart

illustrates this part of the book by showing the comparative apparent size of the blood corpuscles of several important animals under equal microscopic power. The whole study leads inevitably to a conclusion which must be stated in the author's own words:

"The microscope may enable us to determine with great certainty that a blood is *not* that of a certain animal, and is *consistent* with the blood of man; but in no instance does it, in itself, enable us to say that the blood is really human, or indicate from what particular species of animal it was derived."

In conclusion, it must be said that the microscopic drawings are not only of remarkable beauty, but, judging from well-known cases, of great accuracy; and, as their scale is given in every case, and minute directions for reproducing the originals, they have the highest value. They were all executed, we are told, by Mrs. Wormley, to whom the book is most appropriately dedicated, and who has earned the thanks of every scientific man. C. W. H.

Recent Works on Diseases of the Genito-Urinary System.

Urinary and Renal Derangements and Calculous Disorders. Hints on Diagnosis and Treatment. By Lionel S. Beale, M.D., Fellow of the Royal Society, etc. 8vo. pp. vii. 356. Philadelphia: P. Blakiston, Son & Co., 1885.

A Practical Treatise on Urinary and Renal Diseases, including Urinary Deposits. Illustrated by numerous cases and engravings. By William Roberts, M.D., F.R.S., etc., assisted by Robert Maguire, M.D., etc. Fourth edition. 8vo. pp. xvi. 628. Philadelphia: Lea Brothers & Co., 1885.

A Practical Treatise on Diseases of the Kidneys and Urinary Derangements. By Charles Henry Ralfe, M.A., M.D. Cantab., etc. With illustrations. 8vo. pp. xii. 572. Philadelphia: P. Blakiston, Son & Co., 1885.

On Renal and Urinary Affections. By W. Howship Dickinson, M.D. Cantab., F.R.C.P., etc. Miscellaneous Affections of the Kidneys. 8vo. pp. x. 343. New York: William Wood & Co., 1885.

The Pathology and Treatment of Stricture of the Urethra and Urinary Fistulæ. By Sir Henry Thompson, F.R.C.S., M.B. Lond., etc. Fourth edition. 8vo. pp. xii. 254. Philadelphia: P. Blakiston, Son & Co., 1885.

The last year or two have been marked by unusual activity in the study of disorders of the genito-urinary apparatus, both functional and organic. In regard to the former, there have been important investigations by a considerable number of English physicians, while in regard to the latter the most marked activity has been on the Continent. One of the results of this state of affairs is the appearance of a number of new, or newly edited, works on the diseases of the genito-urinary organs, five of which, coming from Great Britain, are before us for review. We

shall therefore take them up together, considering first those which treat of diseases of the secreting apparatus, and then the one which treats of the disorders of the channel of exit for the urine.

When a book of hints covers more than 350 pages it must be very good indeed to escape being shoved aside by systematic works, amid the press upon the time of busy men. The book of DR. BEALE has attained to this length without, we think, attaining this standard of merit. It is certainly, in some respects, a good book, and calculated to be of benefit to those who have the time to go through it. But it is by far too prolix and diffuse to be recommended to those who are in any hurry.

As a sample of the author's style, we may cite a few lines from his chapter on Urinary Deposits: "The subject of urinary deposits," he says, "must always be of interest to the practitioner, and it is of considerable practical importance. In consequence of the expansion of other departments of medical inquiry, less attention has been given to urinary deposits of late years than formerly, but as no one can successfully treat many forms of urinary disease, unless he is familiar with the character of urinary deposits, and acquainted with the methods, chemical as well as microscopical, of identifying them and demonstrating their exact nature, the practitioner should take every opportunity of studying the character of the deposits commonly found in urine in various cases of derangement and of actual disease." Here is an excellent idea spread out in an involved sentence, three times as long as it ought to be. It is succeeded by the following disheartening, and, happily, too gloomy, enunciation: "Considerable practice in the wards of the hospital and some patience are necessary for any one who would become familiar with the multitudinous forms of the substances which constitute urinary deposits." Now no one who has paid special attention to the study of deposits in the urine will deny that it does require considerable practice and great care to acquire a knowledge of *all* of the "multitudinous forms" which are to be seen in some deposits; and yet it is just as true that a very limited experience, combined with scrupulous carefulness, will suffice to put one in a position to recognize those which are most common and most important. It is partly because so many men think the examination of urine a very difficult matter that so few know its essentials, which are quite within the reach of everybody.

The laxness of the author's expressions is seen in such sentences as the following: "Among the least common forms of opalescent urine, is that which depends upon an admixture of chyle, known as 'chylous urine.' The fluid is white and opaque. . . . Most of the cases observed, it will be found, originated in the tropics, where the condition is by no means uncommon. . . . Both urates and fatty matter in a molecular state as it exists in chylous urine exhibit molecular movements," etc.

We must let this suffice to indicate what we believe to be a very serious fault of manner in this book. As to its matter, we can in the main commend it very highly. There are here a great many practical suggestions, which are the fruit of years of study and experience, and which cannot fail to be of service to those who have had less of both than the author has had. We cannot but think, however, that a little more of the surgical spirit might have helped him to better results than he reports in some of his cases of so-called irritability of the bladder, as in one where after three months of treatment the patient was able to hold his water

for an hour (!) at a time; or in that in which the patient after a year's medication managed to retain his urine for three or four hours.

The chapter on Derangements of the Sexual Functions attracts us by its high order of moral excellence. It reads like an anticipation of the present revulsion of sentiment in England in regard to sexual indulgence. It handles a delicate subject in a clean way, and, while it is sometimes more like a sermon than a treatise addressed to medical men, it maintains what is right and pure, and deserves admiration for this.

It has been impossible to subject this book to a systematic criticism, because it is so unsystematic a book. The title adopted by the author seems to deprecate too strict a judgment of it; and it may perhaps be best to look rather at the merits of Dr. Beale's ideas than at the loose and shapeless garb in which they present themselves.

The design of DR. ROBERTS'S work is, in the author's words, to give an account of the organic diseases of the kidney, and of those diseases and disorders of which the chief characteristic is some alteration of the urine. The first part of it comprises a study of the normal physical and chemical characteristics of the urine, and of those which take their place in disease. This is managed in a way which is both simple and comprehensive. No attempt is made to imitate the elaborate methods described in many of the German treatises on analysis of the urine, and yet enough is explained to make it possible for any one to learn how an examination of a suspected urine ought to be conducted. The cuts which accompany this part of the book are most excellent, those which figure the various deposits in the urine being of a kind which are indispensable to the student or practitioner, unless unusually experienced in the microscopical examination of sediments.

The second part of the book treats of what the author calls "urinary diseases," which might, perhaps, be more accurately designated "functional diseases of the urinary apparatus:" that is to say, diabetes mellitus and insipidus, gravel, and chylous urine. Why the author does not class paroxysmal hæmoglobinuria with these we cannot see.

The third, and largest, part of the book treats of organic diseases of the kidneys in a very full and satisfactory manner; and, finally, entozoa, and anomalies of position, form, and number of the kidneys are considered.

The previous editions of this book have made it so familiar to, and so highly esteemed by, the medical public, that little more is necessary now than a mere announcement of the appearance of this, their successor. But it is pleasant to be able to say that, good as those were, this is still better. In fact, we think it may be said to be the best book in print on the subject of which it treats. A good peculiarity of the book is, that the illustrative cases which it contains have been most judiciously introduced. Reports of cases are apt to constitute a much more considerable addition to the volume than to the worth of books; but here it is different: the cases are so well selected, and so well described, that they add very much to the value of the more didactic parts of it.

There are a few points on which our opinion does not quite coincide with that of the author, and there are one or two matters which are treated in what seems to us an inadequate way. Examples of this are to be found in the few paragraphs devoted to leucin and tyrosin, which are disposed of as if the author was rather glad to get them out of the

way; as he well might be in view of the little that really is known about them. Perhaps we would have been better satisfied with this brevity, if it had admitted of some statement from the author as to the comparatively slight significance of these sediments, in view of the fact that they are hardly ever found, and when found, are rather known by the general condition which they accompany, than it is known by them.

The bibliography at the end of the book is interesting, as indicating the sources from which, in addition to his personal experience, the author has drawn his information.

As a whole, this new edition of Dr. Roberts's book is not only worthy of all the reputation which the previous ones have gained, but is better still than they were. It is a source of regret that we cannot give it a more extended review, but this regret is mitigated by the thought that "good wine needs no bush." The author's acknowledgment of the services of his colleague, Dr. Maguire, in bringing the work up to the level of the present state of knowledge on the subject indicates the share of credit which he deserves for its excellence.

Finally, we may add that the mechanical execution of the book is on a par with its literary and scientific merits, and well sustains the reputation of the publishing house from which it comes.

The title and the opening sentence of the preface of Dr. Ralfe's book furnish illustrations of a common practice which we believe to be a fault, namely, the incorrect use of the adjective "urinary" in the expressions "urinary derangements," "urinary pathology and therapeutics." These, doubtless, indicate the derangements of the urinary apparatus, and the pathology and therapeutics of these derangements; but they might be naturally construed to mean derangements and a pathology which in some way have the qualities of the urine, and therapeutics such as are said to be employed in certain parts of Asia, where urine is used as a remedy.

The object of the volume is stated by the author to be to present the student and practitioner with a clear, concise, and systematic account of this subject. And he has succeeded admirably in the task set before him; for his book is really clear and concise, and far more complete than books of the same class usually are. It opens with a chapter on the general symptomatology of kidney diseases. This includes changes occurring in the kidneys themselves, and those taking place in the vascular system elsewhere, as well as manifestations of nervous disturbance, and of disorders in the eyes, lungs, digestive track, and skin.

In the next chapter there is a very good account of the best methods of examination of the urine. From this we miss one detail which we believe to be very important, and the mention of which cannot be regarded as superfluous; that is, a charge to have the sample of urine absolutely unadulterated. But, with this exception, we should find it hard to improve on what is so well done. The book has been issued too soon, we suppose, to admit of its including among the tests for ingredients of the bile that which has been so recently proposed by Dr. Oliver. Under the head of leucin and tyrosin, it is interesting to find a quotation of the statement of Dr. Anderson, that these are to be found more frequently than has been heretofore recognized, and that they are to be met with in a number of pathological conditions of the liver.

On page 151 we observe the remarkable classification of a number of

deposits as "organized," not one of which is organized in the proper sense of this term, and one of which—the ammonium-magnesium phosphate—cannot even be called organic, the term which the author should have applied to the whole class.

The remaining chapters of the book deal with the various diseases to which the kidneys are subject. As an example of their excellence, we may cite the section on movable kidney. Here we might, however, interpose a suggestion as to the expression of the author that the kidney is a retroperitoneal organ. To be precise, we doubt that this can be held to be a feature peculiar to the kidney. It is true it lies behind the peritoneum; but so do all the abdominal viscera. The others differ from the kidney in the fact that they are closely and almost entirely surrounded by the peritoneum, having only a slender stalk to connect them with the framework of the body, while the kidneys are but loosely invested by this membrane, and usually only upon one side. In cases of movable kidney, however, the organ must have a peritoneal pouch in which it is almost wholly included, and which makes it resemble more nearly the other viscera, *quoad hoc*. Like them, the kidney is derived from the mesoblast in the embryo, and the lamination which leads to the differentiation of a peritoneal coat, closely hugging the other viscera and leaving a slight interval between it and the capsule of the kidney, is a single developmental process, differing only in degree in different parts of the abdominal cavity. Only such a conception of the development of the coverings of the kidney can explain the phenomena of floating kidney. The author himself must have recognized this, for he speaks of the kidney being sometimes surrounded by the peritoneum and connected with the spine by a double fold of membrane called the mesonephron.

A short appendix at the end of this book gives the methods of quantitative analysis most commonly used, and a good index concludes it.

As already intimated, this book seems to us to be worthy of high commendation. It is not without some minor blemishes; but, as a whole, it is remarkably trustworthy. Its style is clear, and the illustrations are generally good, many being very good indeed. Modern taste seems to justify the binding of books of a serious sort in gay, and, we might almost say, frivolous colors. So this one appears in a gorgeous red cover. Perhaps this is better, than that a severe taste should make one's shelves monotonous.

Dr. Dickinson's book is an American reprint of the third part of his valuable treatise on the disorders of the urinary apparatus. As a whole, this work is a monument to the experience and research of its author, and of its three parts that now before us is in some respects the most important. It is rich in the details of the subject which it considers, and would be invaluable to any special student of it. We have not found it possible to follow the author to the conclusion of all of his arguments; that in regard to the pathology of chyluria, for instance, which seems to us to be far from explicable at present. But, in the main, the matter of his book has secured our admiration. Unfortunately, we cannot say the same of the style in which the matter is clothed. This is sometimes very poor indeed. In the first place, the title contains the misuse of the word "urinary," to which we have taken exception in commenting upon the book of Dr. Ralfe. Our objection to this may be hypercritical, and certainly these two authors are not peculiar in using the word in the manner

to which we object. Still, we think it worth while to call attention to the matter, as it is in some sense an index of a laxity of style which strikes us as spreading. The very book before us, for example, is full of errors of style which detract very much from its charms. For example, we read, on page 9, that certain patches "are surrounded and intermingled with *vascularity*." On page 151 we are told that "On the observation of Dr. Ord indigo must be added to the list of substances which *concrete* in the kidney." On page 211, it is said "Vesical *irritation and frequency* have occasionally been noticed." In the preface, the author says: "It was my design to follow the publication of *Albuminuria* with an account of the other renal and urinary diseases sufficient for the practitioner, and not too lengthy (!) for the student." Another paragraph says: "I have not hesitated to fill up the deficiencies of my own observation with that of others." And again: "Pains have been taken to make each subject level with the time."

With this criticism, however, we are at an end of our fault-finding. The matter of the book is so excellent that it more than outweighs the defects of style to which we have referred. It is very interesting to see the range of the author's reading, from the antique account of Ambroise Paré of the vivisection of the *Franc-Archer de Meudon* (which he does not state was attributed to that famous old lithotomist, Germain Colot), in search of the seat of the pains of nephritic colic, to the *Transactions of the College of Physicians of Philadelphia*. The investigations into the statistics of nephrectomy, made by Dr. Harris, of Philadelphia, and published in this Journal in 1882, have not escaped the author's attention.

Some of the cuts in this book are very good, and some of them are very bad. The general appearance of the publisher's work is about the same as is found in other books of this "Standard" series. It will probably give the author some pain to contrast this with the appearance of his English edition, but if he gets a suitable honorarium he may be consoled. For the reader it is different; he will probably be glad to get what the author has written so much cheaper than he could get the original edition, and he may be thankful to have it brought within his reach, even at a little sacrifice of its appearance.

There is not much to say in announcing the appearance of another edition of Sir Henry Thompson's well-known book. In it the author has brought his treatment of the subject up to the position of the present state of knowledge, and has simply improved what was before a standard work. The bulk of the book has been reduced about a hundred pages by the removal of discussions in regard to matters which have passed beyond the stage of controversy, and which can now be treated of in a shorter and more authoritative manner. The illustrative cases have also been removed, the author having substituted for them bare statements of his personal opinions, a method decidedly advantageous to the student, and warranted by the high position which Sir Henry Thompson occupies in regard to this subject.

The mechanical execution of the book is of a quality which is well fitted to the work of the writer; paper, printing, and binding being all excellent. C. W. D.

A PRACTICAL TREATISE ON THE DISEASES OF CHILDREN. Third American from the eighth German edition. Revised and enlarged. Illustrated by six lithographic plates. By ALFRED VOGEL, M.D., Professor of Clinical Medicine in the University of Dorpat, Russia. Translated and edited by H. RAPHAEL, M.D., late House Surgeon to Bellevue Hospital; Physician to the Eastern Dispensary for the Diseases of Children, etc. 8vo. pp. 640. New York: D. Appleton & Co., 1885.

COMPARATIVELY few medical books have been so distinctly stamped with the seal of professional approval as has Professor Vogel's Treatise on the Diseases of Children. Having reached the eighth edition in German, and having been translated into all of the principal languages of the civilized world, there remains but little for the bibliographer to do save to chronicle those changes which keep the work abreast of current pediatric literature.

The previous American edition was based upon the fourth German; the present one corresponds to the eighth German edition. While the text affords abundant evidences of revision, it has not, except in a few instances to be presently mentioned, undergone any very material alteration in the fifteen years which have elapsed since its translation. In fact, the added matter amounts to less than forty pages, fully one-half of which is supplied by the editor, while the scissors have been used very sparingly—perhaps too sparingly. The editor has performed his share of the revision acceptably, and his annotations materially add to the value of the book. He has, moreover, inserted an article on cerebro-spinal meningitis, which subject is not discussed in the author's edition.

The arrangement of the subject-matter is considerably altered and improved; for example, diphtheria is now placed in the group of miasmatic diseases, instead of, as formerly, among the diseases of the digestive apparatus (mouth).

Scarlatina and kindred affections are transferred from the chapter on skin diseases to a separate one headed "Eruptive Fevers." It, however, seems questionable whether pemphigus benignus (contagiosus) properly belongs in this chapter.

The most important additions to the text are found in the chapters on artificial nutrition, on the difficulties of dentition, on nervous diseases, and on diphtheria.

In the excellent chapter on the "Nursing and Care of Children," Prof. Vogel briefly discusses, for the first time, the danger of transmitting tuberculosis to the infant by the use of milk from infected cows. While according due consideration to experimental facts, he concludes that: "The numerous experiments with rabbits, sucking-pigs, and the like, are by no means capable of rendering satisfactory conclusions for the human being; moreover, the assertions that tuberculosis was produced in the human being by the use of milk and meat of consumptive animals, always leaves room to suspect the existence of an hereditary taint, which is now so widespread among the masses." Nevertheless, in the presence of suspicious circumstances, he deems it best to adhere to the old rule of using none but boiled milk, "since boiling destroys all spores, germs, and contagious particles."

We would be glad to note greater changes in the sections devoted to

the diarrhœal maladies. While it may be true that there is no essential difference in the etiology or pathology of cholera infantum and the other forms of summer diarrhœa, yet typical cases of the former contrast so strongly in symptomatology and fatality as certainly to entitle it to a separate section. The author still adheres to his method of administering opiates to nurslings, a method which seems singularly inexact and dangerous. "Medicine can seldom, if ever, accomplish much in children at the breast, because most of them unwillingly take anything from a spoon, and spit the fluid out again that has been poured into the mouth. For these reasons the pencilling of the mouth with laudanum is the most convenient and practical procedure. For this purpose I use a camel's-hair brush, dip it into the laudanum, shake off the first drop by snapping it with the finger, and then introducing it into the mouth of the child, press the chin a little upward, and pull the brush out from between the compressed lips. In this manner about half a drop is left in the mouth, and if two or three drops of water are dripped upon the tongue, the child will swallow all of the contents of its mouth without delay."

The importance of a proper diet in the treatment of the digestive disorders of early life is strongly emphasized throughout the section, and it is boldly stated, "had I the choice, when compelled to treat an intestinal catarrh by diet or by medicine only, I would prefer the dietetic treatment."

The chapter on the diseases of the respiratory organs, covering about sixty pages, is one of the best in the book, yet a certain amount of scepticism is pardonable in regard to some of the author's statements. For instance, we are told that "empyema occurs so rarely in early infancy that the most experienced Pediatricars (?) have only been able to report a few solitary instances. On the other hand, general pleuritic adhesions are often found in young children, who, during life, suffered from pulmonary affections, particularly from phthisis pulmonalis. In older children empyema occurs not infrequently, becomes, when no complications are present, tolerably quickly absorbed, and leaves behind it no remarkable deformity of the thorax. Altogether, pleurisy in the first age of childhood may be regarded as an extraordinarily rare affection, and as a tolerably infrequent one after the beginning of the second dentition."

Pleurisy is certainly not as rare in early life as the above quotation would imply, and we know of no other author who speaks so confidently of the cure of empyema by the absorption of the pus.

Roob juniperi, which the translator, in a foot-note, informs us is the succus spissatus juniperi of the European pharmacopœias, and is somewhat stronger than a fluid extract, is praised as the best of all diuretics for the removal of pleuritic effusions. The nitrate and acetate of potash are ineligible on account of their bad taste and drastic effect, while the iodide, so justly popular in this country, is not even mentioned.

The principal changes noticed in Chapter V., on Diseases of the Nervous System, are the insertion of a short article on Suctus Voluptabilis (voluptuary indulgence), or in plain English "thumb-sucking," and a few notes on the etiology and prognosis of essential paralysis. This latter article is still susceptible of much improvement. We have long considered Dr. Vogel's article on tubercular meningitis as one of the best short descriptions of the disease with which we are familiar.

Aside from alterations in the arrangement, the only change made by

the author in the section on diphtheria consists in the insertion of two or three lines on the use of apomorphia as an emetic in croup, but the editor has wisely introduced some of the later investigations on this subject.

The article on abdominal typhus, although not altered in the present edition, is deserving of special mention as being a full and excellent exposition of an important subject which is too often ignored by writers on the diseases of children.

The morbid alterations which typhus (typhoid) fever brings about in the infantile organism are not so decided as in the adult; and since the symptoms are, as a rule, correspondingly less intense, he who is not aware of these facts is liable to be slow in recognizing the disease.

Prof. Vogel strongly advises against the use of all debilitating remedies or measures from the first indication of the disease. Cold is looked upon as the best remedy for reducing fever and relieving congestion of the head. The antipyretic action of chinin, salicylic acid, and eucalyptus, so generally recommended by late writers, is stated to be by no means always permanent or marked. The following paragraph, to which the translator offers a mild protest, reads queerly in the light of modern teaching:

"The restlessness of a typhous child interferes with the use of the thermometer to determine the temperature of its skin, because, as is well known, the instrument must be entirely surrounded by integument, and allowed to lie quietly for from fifteen to twenty minutes. It is therefore better to observe the warmth of the forehead, trunk, and extremities, with the hand previously warmed, no matter under what disease he may be laboring, and this kind of examination, practised a few hundred times, gives such an amount of skill, in distinguishing the different degrees of temperature, that thermometric measurements, always requiring a certain amount of time, and often totally impossible, will be entirely unnecessary for any practical purpose."

As above stated, the editor has supplied a good article on cerebro-spinal meningitis. It is held to be a specific infectious disease, with localization upon the meninges of the brain and cord, analogous to diphtheria, with its manifestations upon the tonsils and throat. The erratic character of the epidemics, the great variation of the symptoms in individual cases, and the difficulties of diagnosis, are distinctly set forth. Chapter IX., which concludes the book, contains an excellent *résumé* of existing knowledge on rachitis, scrofulosis, and tuberculosis, although there are but few changes from the text of former editions.

In conclusion, this edition will doubtless receive the same cordial welcome from the profession which has been heretofore accorded the successive issues of Dr. Vogel's treatise, and to which it is justly entitled by its merits.

W. J. C.

Recent Works on Chemistry.

Principles of Theoretical Chemistry, with special reference to the Constitution of Chemical Compounds. By Ira Remsen, Prof. of Chemistry in the Johns Hopkins University. Second edition, thoroughly revised and enlarged. 12mo. pp. 242. Philadelphia: Henry C. Lea's Son & Co., 1883.

Inorganic Chemistry. By Edward Frankland, Ph.D., D.C.L., LL.D., F.R.S., Prof. of Chemistry in the Normal School of Science, London, and Francis R. Japp, M.A., Ph.D., F.I.C., Assistant Prof. of Chemistry in the Normal School of Science, London. 8vo. pp. 693. Philadelphia: Lea Brothers & Co., 1885.

A Treatise on Practical Chemistry and Qualitative Inorganic Analysis, adapted for use in the Laboratories of Colleges and Schools. By Frank Clowes, D.Sc. Lond., Prof. of Chemistry at the University College, Nottingham. From the fourth English edition. 12mo. pp. 376. Philadelphia: Lea Brothers & Co., 1885.

Manual of Chemistry. A Guide to Lecturers and Laboratory Work for Beginners in Chemistry. By W. Simon, Ph.D., M.D., Prof. of Chemistry and Toxicology in the College of Physicians and Surgeons, Baltimore, etc. 8vo. pp. 411. Philadelphia: Henry C. Lea's Son & Co., 1884.

The Medical Student's Manual of Chemistry. By R. A. Witthaus, A.M., M.D., Prof. of Chemistry and Toxicology in the University of Buffalo, and in the University of Vermont, etc. 8vo. pp. 370.

A Text-book of Medical Chemistry for Medical and Pharmaceutical Students and Practitioners. By Elias H. Bartley, M.D., Adjunct Prof. of Chemistry and Lecturer on Diseases of Children in Long Island College Hospital, etc. 12mo. pp. 375. Philadelphia: P. Blakiston, Son & Co., 1885.

Fownes' Manual of Chemistry, Theoretical and Practical. A new American from the twelfth English edition, embodying Watts's "Physical and Inorganic Chemistry." 12mo. pp. 1056. Philadelphia: Lea Brothers & Co., 1885.

Chemistry: General, Medical, and Pharmaceutical, including the Chemistry of the U. S. Pharmacopœia. By John Attfield, F.R.S., M.A. and Ph.D. of the University of Tübingen, etc. Tenth edition, specially revised by the author for America. 12mo. pp. 727. Philadelphia: Henry C. Lea's Son & Co., 1883.

Applied Medical Chemistry. By Lawrence Wolff, M.D., Demonstrator of Chemistry in Jefferson Medical College. 8vo. pp. 174. Philadelphia: P. Blakiston, Son & Co., 1885.

It is possible that a doctor may be a successful practitioner without understanding the mode of preparation, the physical and chemical properties, the incompatibilities, and the chemical antidotes of the medicines

he uses. Likewise there have been famous operators who knew almost nothing about the anatomy of the parts they boldly invaded.

They could cut straight to the mark, and tie any bleeding vessel encountered, without concern as to its name and connections. The doctor and the surgeon have succeeded in spite of their ignorance of many things a knowledge of which most men would find helpful if not essential.

Whatever praise is given to physiology as a fit study for the physician, applies with at least equal force to chemistry. The phenomena of life are in great part chemical processes which must be studied according to chemical laws. The body is still a chemical laboratory, whether these processes are healthy or whether they experience the variations called pathological. The progress of physiology as a science can be measured by the extent to which at the time it has resolved the great organs of the body into physico-chemical apparatuses. The "new chemistry" is based upon the study of atoms, and even at this extreme of refinement it has physiological bearings.

Recent observations indicate that there is a correspondence between the specific atomic grouping and physiological action. It is but one step to those primary changes in the fluids and tissues which initiate disease. Even more significant has been the advance made in zoöchemistry along the line of changes induced by the pathogenic bacteria. A thorough knowledge of the infections must take in the chemical products and effects of the microörganisms whose pathological importance is now generally conceded. In the list which heads this review are to be found works widely varying in their scope, but all of which contain facts or speculations more or less intimately connected with medical science. The first in order is the least practical, but by the light of late investigations the study of the molecular constitution of chemical compounds seems destined to help the sciences of physiology and pathology even as that other science of less minute things, biology, has helped them.

PROF. REMSEN, as a chemical teacher, has had occasion to mourn over students devoted to formula worship, a cult to which bright ones seem inclined. Not that there is anything injurious in this exercise of one's invention, but the product is generally appalling to one who knows all that a formula should convey. He has put forth this attempt to guide the tyro in his speculations. It is scarcely necessary to add that his work is well done.

The disposition to endow a formula with a wealth of functions has nowhere been given freer swing than in the treatise by FRANKLAND and JAPP. With such a text-book chemistry can be made to serve very well in the place pure mathematics has held as a disciplinary study. There is an abundance of abstract thought, and of calculation with concrete instances of practical value, It is well up with the newest chemical work, being the only book on our list that mentions the fact that ozone by extreme cold and pressure has been condensed to an indigo-blue liquid. Much is expected of Prof. Frankland on the subject of water analysis. The reader will find an orderly presentation of the best known facts about the impurities of potable waters, standards of purity, and the significance of various contaminations, but he will be disappointed if he looks for detailed instruction in the latest methods of sanitary examination. We wish that here, at least, the authors had adhered less

strictly to their plan not to impart definite knowledge in this or any other branch of applied chemistry. The medical student will need some other work to serve him in his pharmaceutical, toxicological, or sanitary studies.

For an ordinary laboratory course in inorganic analysis, such as some colleges provide for first year students, CLOWES will do certainly as well as any book now in use. It has grown with the experience of a practical teacher, and uses methods approved for accuracy and easy execution.

The work of DR. SIMON has more especial reference to professional life, and in its organic section covers the important clinical field of urinology. It has a unique feature, which would be of service to a self-taught beginner, namely, the hand-painted plate showing the color of precipitates. Perfect fidelity has been insured by using, whenever possible, the precipitated chemical itself as a pigment.

The progressive character of chemistry makes the first edition of WITTHAUS betray its age, though only two years have gone by since it was issued. The arrangement of the *paraffins* as hydrides is one discarded by the best of late writers. So small a defect is hardly worth mentioning in commenting on a work so full of good points. None of the philosophic truths of chemistry have been neglected, nor have the peculiar requirements of the medical student been forgotten.

In the methods of quantitative analysis there is shown a commendable sense of the doctor's limited opportunities. For example, having given the method of Dietrich for determining the quantity of urea in urine, the author, as if conscious that most physicians would be repelled from it by the calculations and the graduated apparatus required, gives the less accurate but handy process of Fowler, based upon the loss of specific gravity of the urine after the decomposition of its urea by the hypochlorite of sodium. It resembles Roberts's "differential density" method for sugar, and is so simple that we quote Witthaus's description entire:

"To apply this method the sp. gr. of the urine is carefully determined, as well as that of the liq. sodæ chlorinatæ. One volume of the urine is then mixed with exactly seven volumes of the liq. sod. chlor., and, after the first violence of the reaction has subsided, the mixture is shaken from time to time during an hour; when the decomposition is complete, the sp. gr. of the mixture is then determined. As the reaction begins instantaneously when the urine and reagent are mixed, the sp. gr. of the mixture must be calculated by adding together once the sp. gr. of the urine and seven times the sp. gr. of the liq. sod. chlor., and dividing the sum by eight. From the quotient so obtained the sp. gr. of the mixture after decomposition is subtracted; every degree of loss in sp. gr. indicates 0.7791 gram. of urea in 100 c. c. of urine."

After referring to the fact that the presence of a large amount of chlorine in drinking water serves to indicate that organic impurity is of animal origin, he states: "Indeed, when time presses, as during an epidemic, it is best to rely upon determinations of chlorine, and condemn all waters containing more than 0.015 gram. per litre (one grain per gallon)."

The easy execution of this test by volumetric analysis, recommends it, but to make it a just standard there must be a sliding scale. "One

grain per gallon" might justify suspicion of surface waters, which, if free from pollution, rarely contain more than 0.7 grain per gallon, but deep wells and springs, and some shallow wells in unpolluted alluvial soil, often contain as much as 2 grains per gallon, although entirely free from organic contaminants. To make this test available, it is important to know the normal purity of the water supply of the given district, and take that as a standard.

If a sample contains chlorine below the average, or normal in amount, it is highly probable that no sewage has polluted it. An excess would mark the source as suspicious. It would be wise to suspend its use or boil the water before using, until the ban has been removed by a better opinion of it from expert examination for organic matter.

Another significant test of easy application is stated by DR. BARTLEY to give some idea of the safety of a drinking water. The reagent is diphenylamine dissolved in an excess of sulphuric acid. This solution is to be added to the suspected sample previously acidulated with sulphuric acid. A deep blue color indicates nitrites and nitrates. This test, connected with the names of Martin and of Kopp, is not so sensitive as Warrington's, with sulphanilic acid and hydrochlorate of naphthylamine. If a water responds with the blue color, it is certainly to be suspected of impurity. A better process for it than that given by Dr. Bartley, is to add the reagent to the suspected water by means of a pipette, allowing it to flow down the inclined side of the tube and collect at the bottom. A blue belt will form at the junction of the two liquids. Performed in this way the test is more certain as well as more sensitive.

Part first of Dr. Bartley's book contains a digest of chemical physics, very good in its way, but some of it is given up to such simple physical truths as are taught in respectable grammar schools, and some deals with optical and acoustical relations commonly considered in physiological study.

The author has had much experience as a medical teacher, and by that light he may find justification for taking nothing for granted when it comes to the student's previous scientific training. If some of this part were relegated to the writers on physiology, there would be more space for those applications of chemistry to bedside investigations, in which the book is deficient.

Chemical physics makes up the earlier chapters of FOWNES' classic treatise, which has no pretension to being medical, and, hence, is not open to the same criticism. It has been dealt with by Mr. Watts in a style that joins fitly to the perspicuous treatment of the older parts. It all wears Fownes' familiar shape, but it may be questioned whether Fownes' ghost would claim any part of it, so great a change of detail has been wrought by the incessant progress of science. It is still a classic, so far as a work of science can be called classic, because for several decades it has had the painstaking revision of men among the ablest of their time. Thus it has been kept in the category of works distinguished for correctness, completeness, and purity of diction.

Different from it in plan, and quite as acceptable to the medical and pharmaceutical student, is ATTFIELD'S well-known book. It is like Fownes', in that it is a good book to keep after college life for reference,

and superior to it as a manual for the laboratory. It has qualities that fit it especially for the needs of a pharmacist.

Dr. Wolff's book has an arrangement of material different from any other in our language. In his preface the author acknowledges indebtedness to various writers of distinction, in English and in German. It will be seen that this novel arrangement has been modelled after that of Ludwig, of Vienna, in his *Medicinische Chemie*. A capital one it is, to supplement the deficiencies of systematic works. It deals especially with the analytical processes of toxicology, and of physiological and hygienic chemistry.

It assumes on the part of the reader some knowledge of the chemical elements and of chemical philosophy. Intended for a laboratory manual, it is scarcely a fault in the style, that it is too much condensed to be considered easy-going English. It is very "business-like" in character, apparently depending upon the *viva voce* explanations of the teacher to clear up obscure points. The matter is brought down to date, and includes the ptomaines, or cadaveric alkaloids, the basic principles generated during putrefaction. These principles have peculiar chemical interest, because they closely resemble in their reactions and physiological effects various toxic vegetable alkaloids, as atropine, strychnine, digitaline, coniine, nicotine, and morphine. According to Brieger, the nature of the poison depends upon the character of the soil in which the bacillus of putrefaction grows. In chemical behavior they are so much like the vegetable group, as to throw doubt upon the certainty of detection of poisoning from the latter. A test once depended on, namely, their power of reducing potassium ferricyanide to the ferrocyanide will not answer for all, as some vegetable alkaloids give this reaction, and all the ptomaines do not.

In his appendix Dr. Wolff gives a summary of other distinctive features which have the sanction of Brieger and Ludwig, and which hold out the prospect that the expert analyst may yet differentiate them with certainty. He says:

"Those resembling strychnine, however, are not crystalline (at least not yet so obtained) and are not as intensely bitter as that vegetable alkaloid. Those giving the veratrine reaction lack its physiological effect, while that apparently analogous with digitaline fails to give a reaction with sulphuric acid and bromine, the cadaveric morphine does not give the blue color with ferric chloride, like vegetable morphine, and the mydriatic ptomaine fails to give the characteristic odor produced by atropine when heated with sulphuric or phosphoric acid."

The use of the plural form would seem to imply that there is more than one ptomaine resembling strychnine, and more than one resembling veratrine. No authority is cited to sustain this, but from the construction of the summary in the paragraph, it appears to be an abstract from Ludwig (*Medicinische Chemie*, p. 346, 1885).

The German writer refers to all but the digitaline-resembling ones with the article, noun, and verb in the singular, as "Das dem strychnin ähnliche ptomain," etc. In other paragraphs concerning them, Ludwig refers to each in the singular number, except the digitaline-resembling ones. Considering the fact that it is a first edition, and that it freely uses formulas and volumetric computations, Dr. Wolff's book is remarkably free from

errors. The verbal inaccuracies occasionally seen are apparently due to hasty proofreading and do not materially affect its usefulness.

It is an excellent compend for the second year student and practitioner. The author has read widely, and given his best efforts at collecting handy, yet accurate, analytical reactions mostly for volumetric tests for poisons, the constituents of animal fluids, and adulterations of food. J. W. H.

RECENT SYSTEMATIC WORKS ON SURGERY.

THE SCIENCE AND ART OF SURGERY. By JOHN ERIC ERICHSEN, F.R.S., LL.D., F.R.C.S. Eighth edition. Revised and edited by MARCUS BECK, M.S. and MB. Lond., F.R.C.S. 8vo. 2 vols. pp. 1124, 1205. Philadelphia: H. C. Lea's Son & Co., 1884.

THE PRINCIPLES AND PRACTICE OF SURGERY. By JOHN ASHHURST, JR., M.D. Fourth edition. Enlarged and thoroughly revised. 8vo. pp. 1118. Philadelphia: Lea Brothers & Co., 1885.

"THE favor that has for so many years been shown by American surgeons to the 'Science and Art of Surgery'" (a favor that Mr. Erichsen so highly compliments us in regarding as "the most honorable distinction that could be conferred upon it") makes it necessary, in noticing a new edition, to have regard only to the author's views upon those questions of pathology and treatment that have especially engaged the professional mind during the last ten years.

The demonstrated influence of organized ferments and irritants in the production of local and general changes and the development of special surgical affections is duly recognized. As a consequence, the chapters on *inflammation* and its complications have been in large measure rewritten and much extended, care being taken clearly to distinguish between what has been proven and what is but inferential and probable.

The value of the "antiseptic method" ("that has revolutionized the practice of modern surgery") and the propriety of using an antiseptic dressing are repeatedly and strongly insisted upon. The various germ-destroying agents in common use are treated of. *Carbolic acid* is "the most convenient antiseptic for cleaning the surgeon's hands and instruments and washing out the wound;" "in open wounds with loss of substance, which cannot be treated by rigid antiseptic methods, such as those resulting from operations on the anus or rectum, or from excision of the tongue or jaw, the direct application of *iodoform* to the raw surfaces is of the greatest possible use, and is the best method of treatment at present known," though such application "to the raw surfaces of fresh wounds before closing them" is not recommended, being "a needless introduction of a foreign body;" *boracic acid* is "one of the less powerful, and at the same time one of the least irritating of chemical antiseptics;" *salicylic acid*, possessing no toxic properties, "in this respect presents advantages over carbolic acid;" *corrosive sublimate* (noticed in an appendix to the second volume), "a most powerful and efficient antiseptic . . . capable of being safely used in the treatment of wounds, is locally irritating, and generally poisonous, and, as it possesses these properties in a

higher degree than most others, a corresponding degree of caution is necessary in the preparation of the solution and dressings, and in their use." The spray apparatus, an instrument "which can most readily be spared," because of giving great and additional security, had better be used "during the early treatment of a large chronic abscess," and "in all cases in which cavities are opened, . . . especially if the cavity is one in which putrescible matter is likely to accumulate, and which it is impossible thoroughly to cleanse or drain; thus it is of great use in small openings into the pleura, abdomen, or joints."

When the surgeon can secure the "more complicated chemical and surgical appliances . . . which are essential to the success of many modern methods of treatment, let him by all means use them . . . but let him remember that wounds were healed safely, speedily, and well before they were invented. . . . If he is not in the land of spray-producers, protectives, and guards, of iodoform and salicylic acid wools, let him not despair, cold water and clean linen rags will do much to supply their place." In the treatment of abscesses "in the absence of all antiseptics, decomposition may be reduced to a minimum by securing perfect drainage, by free incisions and tubes, so as to reduce the decomposable matter to the smallest possible quantity; and by avoiding the use of water, both during the opening of the abscess and afterward."

In the chapter on gunshot wounds it is directed that "above all the surgeon must avoid that most pernicious practice of exploring the wound with a grimy finger or unclean probe, thus at once and with certainty infecting it to the very bottom." Would that it were possible to fix this principle in the minds of all who have to do with this class of injuries in civil as well as military practice.

In the chapter on *head injuries* there is not to be noticed any material change in the author's views as previously expressed; but much has been added in reference to both pathology and treatment. The subject of cerebral localization is discussed at considerable length, Lucas Championnière's rules for the application of the trephine being given, and diagrams introduced showing the position of the fissure of Rolando and the adjacent motor-areas.

In the subsection on foreign bodies in the windpipe, Dr. Weist's paper, "a study of 1000 cases," read before the American Surgical Association, at its Philadelphia meeting in 1882, is twice referred to, the author's name appearing as West. Extirpation of the larynx, that in the previous edition (when it had been made only for cancer) was a "barren triumph of surgical skill," now has in it "some prospect of advantage . . . especially when the disease is recognized early and is intrinsic, and more especially if it is sarcomatous. In extrinsic malignant disease it is very doubtful whether it is a justifiable procedure. . . . Laryngectomy, indeed, appears to offer no advantages over tracheotomy in such cases."

In penetrating wounds of the abdomen, when there is no clear evidence that the intestine has been injured, laparotomy is not favored; and is but hesitatingly approved when "no doubt exists as to the intestine being wounded." When the bladder is ruptured, the wisest plan of treatment is thought to be "to drain by means of a large soft catheter, through which the peritoneum may be washed out antiseptically; should this not be practicable through the urethra, then lateral perineal cystotomy should be done, with the double effect of securing perfect drainage, and enabling the surgeon to wash out freely."

As might have been expected, material change has been made in the chapters on *diseases of the abdomen*, since "in no department of surgery has there been a greater advance during the last few years than in the operative treatment of diseases of the abdominal and pelvic viscera." Several pages have been added on the "special dangers common to all abdominal operations, and the principles which guide us in avoiding them;" and due notice is taken of removals of portions of the intestine (*enterectomy, pylorectomy*), of gastro-enterostomy, of operations upon the liver and the spleen. What were a few years ago simply "surgical audacities," are now legitimate and proper operations. Recognition is made "of the merits of those surgeons who boldly and skilfully have led the advance in this department of our art, and of the vast importance of the results thus achieved by them;" though a caution is given that "an operation is not necessarily justifiable, because it is practicable—that every act of operative audacity is not a triumph of sound and legitimate surgery—and that a patient's life may possibly be prolonged on conditions less tolerable than death."

The extensive operations that in the last few years have been made in cases of cancer of the breast, operations that have "so far been attended with the most satisfactory results," are duly noticed; and many a patient in England and this country may have to thank Mr. Erichsen for the statement that "better results have of late been obtained by free removal of the affected gland with the surrounding skin and the axillary glands."

Rapid lithotrity (litholapaxy), introduced into surgical practice since the appearance of the edition of 1878, is stated to constitute "an immense and most important advance in lithotrity . . . and its universal adoption by lithotritists is the best evidence of its utility It makes lithotrity applicable to numerous cases, which, under the older and more slowly conducted system, were not adapted to and could not be safely treated by it."

Everywhere examination of the present edition shows that there has been thorough and careful revision, and that no labor has been spared to make the work a real epitome of surgery, in which may be found correct pathology, clear descriptions, and judicious counsel.

As with "Erichsen" so with "Ashhurst," its position in professional favor is established, and one has now but to notice the changes, if any, in theory and practice, that are apparent in the present as compared with the preceding edition, published three years ago.

The "germ-theory" and the resulting "antiseptic treatment" of surgical diseases and injuries are held in no higher esteem than before; "the alleged superiority of the 'antiseptic method'" is still "as yet" undemonstrated; and it is declared that "the results obtained by Prof. Lister and his followers are, as far as I have been able to trace them, at least no better than those met with by careful surgeons who employ simpler dressings; and, on the other hand, serious symptoms of poisoning and even death have not unfrequently followed the use of carbolic acid in this way, while the fashionable antiseptic of the moment—corrosive sublimate—has killed at least 22 patients, no less than 7 of these having died in a single American hospital." Even in treating of erysipelas, no mention is made of its microörganism, which has not only been discovered, but cultivated and successfully inoculated upon the human subject.

In the treatment of wounds and lacerations of the abdominal viscera,

laparotomy, with after-applications of ligatures and sutures, is not regarded with much favor, as "it would but add to the patient's danger," or "the prospective benefits of such a proceeding would, it seems to me, in most cases be questionable, while the additional risks that it would entail are manifest." The favorable result of laparotomy in certain cases of peritonitis is referred to. In bladder-rupture cystotomy, "as in the median or lateral operation for stone," is thought "preferable to opening the bladder either through the rectum or above the pubes," and suturing the bladder does not seem to be approved.

Of the propriety of laryngectomy, the author expresses himself as regarding Dr. Cohen's conclusions as "well founded; that while the operation may be justifiable in exceptional cases in which the disease is limited in extent, the greatest good to the greatest number will be promoted, as a rule, by declining attempts at extirpation, and being content with tracheotomy and other palliative measures."

Pyloric and cardiac gastrectomy are, as before, looked upon as operations "hardly within the pale of legitimate surgery." A table of the cases of removal of the pylorus, numbering 84, is given, as also are tables of nephro-lithotomy, nephrectomy, splenectomy, and cholecystotomy. Statistical tables of operations of various kinds in the present as in previous editions are numerous, and add not a little to the value of the work as one of reference.

Though neither many nor great changes have been made in the present edition, the work has been brought well up to date; and larger and better illustrated than before, its author may rest assured that it will certainly have a "continuance of the favor with which it has heretofore been received."

P. S. C.

THE INSANE IN THE UNITED STATES AND CANADA. By D. HACK TUKE, M.D., LL.D., F.R.C.P. London. 8vo. pp. 264. London: H. K. Lewis, 1885.

FOR one hundred years the name of Tuke, in England, has been identified with movements calculated to promote the best interests of the insane, with their professional care, or with the medical literature of insanity. The volume before us is by Dr. D. Hack Tuke, well known in this country as joint author with Dr. Bucknill of *A Manual of Psychological Medicine*, and in the line of *Chapters in the History of the Insane in the British Isles*, by the same author. The volume comprises five chapters. The first is devoted to a biographical notice of Dr. Rush—a central figure in the history of American medicine—and to the early lunacy practice in the United States at the period when Dr. Rush published, for the benefit of his pupils and the profession, *Observations on the Diseases of the Mind*, in 1812, six months preceding his death. Considered in the light of the experience of that day, this volume may be regarded as a compendium of the knowledge of the foremost member of the profession of the treatment of the insane in this country, and the history of the medical care of the insane may be said to date from the publication of Dr. Rush's book.

If the remedies of Dr. Rush consisted of bloodletting, blisters, issues, salivation, emetics, purges, and a reduced diet, it must be remembered

he lived at a period in the history of medicine when similar remedies were in use in general practice as well as in asylums, and when the practice of medicine was of the most empirical character. It is hardly probable that the early lunacy practice in America at the time Dr. Rush lived, differed materially from that which prevailed elsewhere, and even he may have been impressed and influenced by what he had been taught and observed in England and Edinburgh, from what appears from the testimony furnished a committee of the House of Commons. The physician of Bethlem stated in 1813: "Twice a year, with few exceptions, the patients are bled, and after that they take vomits once a week for a number of weeks, and after that we purge them." Dr. S. Tuke, in his *Description of the Retreat*, York, 1813, is disposed to think the advocates of this treatment were governed by a principle or philosophy, as he observes: "This plan of treatment (depletion) appears to be founded on the supposition, that irritation or violence proceeds universally from a plethoric habit, whereas I think experience clearly contradicts this opinion;" and Dr. Rush prescribed bloodletting as the first remedy in mania, because of the "importance and delicate structure of this organ (brain), which forbids its bearing violent morbid action for a length of time, without undergoing permanent obstruction or disorganization."

Dr. Tuke says of Dr. Rush:

> "What I should claim for him would be, that he distinctly recognized the corporeal nature of insanity; that to his students and in his writings he taught, that it is a disease that must be submitted to medical as well as moral treatment; and further, that he gave to the profession and to the world, an able exposition of the forms of mental disease."

Dr. Tuke might have added that Dr. Rush lectured to his pupils upon insanity, and, for all we know to the contrary, was the first to impart instruction in this manner upon this branch. As a further contribution to the history of the medical treatment of the insane, and as foreshadowing the change that was about to take place, Dr. Tuke states his father addressed a letter to the governors of the New York Hospital in 1811, in which he writes: "General bleeding and other evacuants have been found injurious at the Retreat (York), and are therefore not used except where their necessity is indicated by the state of the bodily habit." It is quite probable bleeding and depletion were abandoned at York, and to a certain extent in the hospitals of Paris, under the control of Pinel, as early as 1798, and that the reaction against the principles of Dr. Rush subsequently gained ground among his countrymen. Passing to a later period when a number of asylums had been established and some valuable experience gained, Dr. Tuke quotes from Dr. Bell, of McLean Asylum, in his report for 1841: "No individual at the head of an insane institution would now think of combating any form of insanity, with depletory and reducing means, once regarded as indispensable." Reference is made to the testimony of Drs. Wyman (1821), Kirkbride, Todd, Brigham, White, Ray, and Curwen (1852), among the earlier American physicians, against bleeding, purging, and low diet, and in favor of tonics and generous diet. It may be safe to assert that for more than sixty years, bloodletting and similar measures have been abolished in asylum practice. Twenty-five years ago it was a common occurrence to receive patients into the hospitals who had been bled, and within thirty years bloodletting was occasionally resorted to in general hospital practice.

We cannot leave this chapter and the notice which Dr. Tuke furnishes of Dr. Rush, without adding the fact that his recommendations for the humane care of the insane, their moral management and treatment, their occupation, were in advance of his day; and that his pronounced views of the evils of intemperance, and suggestions for the creation of establishments for the custodial care of inebriates, have led the advocates of temperance to look upon him as one of the earliest promoters of their cause, to make pilgrimages to the Pennsylvania Hospital to behold his portrait, and to the place of his interment, as to a shrine.

The second chapter is devoted to "Provision for the Insane in the United States from 1752 to 1876," a period during which seventy-six State and municipal asylums and hospitals were established. A brief historical notice is presented of some of the earlier efforts to make improved public provision for the treatment of the insane, which seem to date from a petition sent by private citizens of Philadelphia to the Provincial Assembly in 1751, for a charter to enable them to found "a hospital for the reception and relief of lunatics and other distempered and sick poor," The humane sentiments incorporated in the act creating the Pennsylvania Hospital were announced forty years before the movement of Pinel, and have such an important bearing on the history of this subject in this and other countries, that we regret Dr. Tuke did not give this historic fact more prominence, and even reproduce the language of the entire preamble of the charter. Dr. Tuke makes appropriate reference to the work of Miss Dix. No complete history of provision for the insane in the United States could be prepared without an acknowledgment of her lifelong devotion to the interests of the insane, or a recognition of the influence exerted by the late Dr. Kirkbride, and the Association of Superintendents of Asylums, upon the plans for construction of new hospitals and their organization. While Dr. Tuke does not offer any opinion or observations upon the prevalent system of asylum construction referred to in this chapter, it must be conceded it was tending toward decided extravagance in plans and administration during the last decade of the period, and that the reaction that followed greatly retarded the completion and erection of new buildings. Several quotations are produced from published reports on the condition of the insane in poorhouses, but the comments and allusions are not in the language that might have been used had this independent and fearless observer written of the wretched almshouse system of this country after personal observation.

The succeeding chapters are devoted to the "Present Condition of the Insane in the United States; Principal Asylums Visited; and the Insane in Canada." Thirty asylums in the States of New Hampshire, Vermont, Massachusetts, New York, Connecticut, Rhode Island, Pennsylvania, New Jersey, Illinois, Wisconsin, Maryland, District of Columbia, and Canada were visited, and the observations and comparisons of such a critical and trained observer will receive respectful consideration on this side. Under the head of "General Management and Treatment," reference is made to the use of mechanical restraint and medical treatment. A table is presented showing that the number of patients in asylums in 1880 was 40,992, of which 2242, or five per cent., were alleged to be under restraint of some kind, including 21 with a chain and ball! The authority on which this extraordinary statement was made is not given, but we have read it with surprise and doubts as to its correctness. If

it was true then, we have no hesitation in observing it was discreditable to the management of our asylums; but, as Dr. Tuke states, "it would be unfair to take these figures in giving a correct representation of the amount of restraint at the present time." It is well understood that differences in practice, honestly but mistakenly entertained, have existed in the English and American asylums. While restraint has been sparingly used, or wholly abolished in many American asylums, and its use openly advocated and supported in the public reports and discussions as a beneficent and even humane measure, it has been demonstrated in the English and Scotch asylums that it may with great advantage be wholly abolished. It would have been more creditable to our American brethren had they met the question with a different spirit—frankly admitted and studied the embarrassments surrounding them, than to have maintained the indefensible position of supporting a system constantly liable to abuses, and lowering the standard of care. To illustrate, Dr. Tuke, in referring to the use of the covered bed, called the "crib," observes, "that, whatever its occasional utility may be, it may be abused will be admitted when I say I counted fifty in use in a single asylum." Better would it have been for our own asylums if so many of the pilgrimages made for the purpose of observing foreign asylums in recent years had been taken at an earlier period. Whatever may have been the public expressions and sentiment of our superintendents in this respect in the past, we are glad to bear our testimony that they have been individually reforming their practice and persistently dispensing with mechanical restraint. Non-restraint in asylum practice has come to mean the substitution of a higher quality of personal attendance, the controlling influence of moral and mild measures, and a higher training of attendants, for mechanical measures and architectural devices. This result, with the attendant accompaniments of an improved system, has been, to their credit, honestly attained by the Scotch and English physicians.

"With regard to the strictly *medical* treatment of the insane, I do not think there is much if any difference between the American and English practice." "It is not so common a practice there (America) as here (England) to employ one or two attendants to take a maniacal patient out into the grounds and allow him to work off his excitement by exercise." Dr. Tuke notices the subject of *recoveries*, which are variously reported at twenty and forty per cent. of admissions, which is a close approximation to the English results; the *mortality*, which ranges from five to seven per cent. of the average number resident, a lower rate than prevails abroad; the alleged difference in type in the *form or intensity of mental disorders* in the two countries, concluding that it does not exist: the *employment* of the insane in asylums, which is less in amount and variety than in English asylums; the care of *suicidal* cases, which are usually placed in dormitories with non-suicidal patients subject to calls from the night-watch, while in England the approved practice is to place such patients in dormitories under the eye of a night attendant in the same room; the care of *epileptic* patients, who are not congregated in dormitories, according to the frequent and approved practice in England, but usually assigned to single rooms; the infrequency of *general paralysis* in American as compared with English asylums, though it is clearly on the increase and bids fair to equal the amount witnessed in the mother country; the dissimilar *lunacy legislation* of nearly fifty States, with what we regard an unfortunate tendency to more stringent laws for admission;

and the *inspection* of asylums by State boards created in thirteen States, in which the author might have recorded the fact that the asylums where such boards had been created showed the greatest evidence of progress and tendency to advancement.

Several pages of this book are devoted to a notice of the attempt to "grappie with the problem of chronic insanity," which has proved as difficult of solution in this country as in England, Insanity has increased faster than the ability and willingness of States to build hospitals to meet the requirements. The creation of the Willard Asylum, in New York, in 1869, of the asylum at Kankakee, Ill., in 1883, the detached system of buildings at Norristown, Washington, Jacksonville, and Middletown, Ct., and the improved county asylum system of Wisconsin, are examples of efforts to care for the chronic, and the acute and chronic insane. They mark a departure from previously existing plans which is likely to impress itself upon buildings for the insane in the future. Dr. Tuke remarks, "I may state that, although not a few in the States look with a critical eye at what they regard as segregation run mad, the principle itself, that of providing many small buildings in place of a large one, is rapidly advancing in the United States."

Among the relative merits of American asylums, Dr. Tuke notes the many ingenious devices which inventive Americans have suggested for the good working of their institutions, which English superintendents might usefully imitate; the greater number of medical men in asylums, and the possibility at least of more individual interest in patients; the appointment of lady physicians, which must yet be regarded as an experiment which "we ought to be grateful to our friends across the water for making," "at the same time I am afraid it must be confessed that the results are but scanty, and fall far short of what had been anticipated from the particular attention thus paid to this department of practice (uterine affections in their relation to insanity), under, as I consider, very favorable auspices;" "and the superior dietary and warming arrangements—the Americans not only feed, but house and warm their patients better than we do." As to the demerits, he doubts the propriety of mixing the paying and non-paying patients; the lack of employment and occupation; the generally bare, unfurnished condition of wards occupied by excited patients; the amount of restraint in use; and closing, "I would say that the outlook with regard to the future of the insane in the United States is very encouraging."

Those of our readers who are desirous of learning the impressions and conditions of the thirty asylums as they appeared to this capable and painstaking observer, will be repaid by a perusal of this book. One hundred and forty-four pages are devoted to detailed descriptions of the asylums visited, which are remarkably correct. Favorable notice is made of the asylums in the Province of Ontario, but the author indulges in the severest criticisms of the condition of the Beauford Asylum, Quebec, and the asylum at Longue Pointe, Montreal.

It is not our province to notice many of the merits and demerits of both the English and American systems which our author has omitted to embrace in the scope of his work. Each may gain from the other by personal examinations in the kindly and fair spirit which he has shown. As a record of steady progress of provision made for the care and treatment of the insane, it is the most complete book yet published in England, and one that no thin-skinned American need be afraid to read. J. B. C.

ACNE; ITS ETIOLOGY, PATHOLOGY, AND TREATMENT. A PRACTICAL TREATISE BASED ON THE STUDY OF ONE THOUSAND FIVE HUNDRED CASES OF SEBACEOUS DISEASE. By L. DUNCAN BULKLEY, A.M., M.D., Physician to the New York Skin and Cancer Hospital, etc. 8vo. pp. 280. New York and London: G. P. Putnam's Sons, 1885.

THIS treatise, embracing in its scope merely a single group of cutaneous diseases, has been written with a care and completeness sufficient to furnish a good abstract of what is actually known on the subjects considered. We should expect no less of it. The field is not a very wide one, nor are the problems it presents of great gravity. What is more or less generally acknowledged to be practically useful in the management of the disorders under discussion, is here set down. Without pretense to much originality, and with a fairly broad survey of the literature of the theme, the pages before us contain details covering the facts and inferences established by the best writers on the disorders of the sebaceous glands.

The original drawings which serve to illustrate the pathological studies on which portions of the book are based, deserve special commendation. For these the author gives large credit to Drs. George T. Elliott and Edward Preble, who also contributed their share to the full and excellent bibliography appended. Similarly careful and scholarly work can be recognized in the "Synopsis of the Classification of Sebaceous Diseases by Writers on General Medicine and Dermatology," which latter occupies seven closely printed pages.

It is, however, to be regretted that by the prominence given to such terms as "acne sebacea" for seborrhœa, and "acne molluscum" for steatoma, a contribution should be made to the existing confusion respecting proper dermatological titles, one of the chief obstacles to a more general study of cutaneous medicine. It may be noted, however, that in the face of these and similar attempts, year after year, the profession in general are more fully adopting the nomenclature sanctioned by the American Dermatological Association.

Touching the treatment of acne rosacea and milium, the author states that "Hardaway has advised electrolysis," and "electrolysis has been recommended for the purpose (Hardaway)" (pp. 127 and 227). This suggests that Dr. Bulkley does not habitually employ the measures designated, and is ignorant of the fact that scores of physicians in this country are, every day, employing with the most brilliant success, electrolysis for the removal of the telangiectases of rosacea, and of the small lesions represented by milia, verruca, etc. Compared with the results thus readily obtained, the method recommended in rosacea of "slitting each dilated capillary with a sharp knife, and then by means of a sharp-pointed stick of nitrate of silver cauterizing the wound," seems both clumsy and ineffective.

There are, however, two main defects in the work; one of less, the other of greater importance. The first is the distinct tendency of the author, exhibited here as in some of his other contributions to medical literature, to enlarge upon points only remotely, if at all, connected with the subject under discussion. If one will consult the concisely written pages of any good modern text-book on cutaneous diseases relating to the sebaceous glands, and take the trouble to read at the same time any equally good modern hand-book on hygiene he will have a very fair

idea of the present work. Dr. Bulkley, for example, devotes no less than three pages to a consideration of milk as an article of diet, and is here betrayed into a somewhat amusing confusion of terms by announcing that "it (milk) should be drunk alone."

A more serious error is, it seems to us, betrayed in his omission to recognize the essential character of a large number of cases of acne and disorders allied to it, that come under the observation of the physician. To these belong the acne-hypochondriacs of both sexes, morbidly conscious from morning to night of a slight facial efflorescence, tireless students of the pictures presented in their mirrors, the fingers persistently playing over the features, shrinking from the gaze of others like social Pariahs, ripe for the hand of the too zealous practitioner, types of the gross and demoralizing self-absorption which is the worst product of our selfish age. To this class belong also the men and women of unimpaired health who can be persuaded to undergo treatment for a disease which is really self-limiting and actually should be untreated.

Our author betrays, however, an instinct for treatment of all cases, that makes his book consistent from beginning to end. Though entitled, "Acne, its Etiology, Pathology, and Treatment," every alternate page is headed "The Treatment of Acne." He teaches (p. 157) that "acne simplex may be regarded universally as a result of debility in some form," a statement that should not be allowed to pass unchallenged. Every one knows that men and women who are, as a matter of fact, slowly dying of incurable disease, have complexions that are, viewed from the standpoint of artistic beauty, exquisitely perfect; and there are hundreds of rugged farmers and farmers' daughters in the country, possessed of a fair share of common sense, who will laugh at the suggestion that their facial acne arises from "debility in some form"! Our author would place them all in the category of "patients" for treatment. "In certain cases," he says, "it would seem impossible to do more than to keep the skin free from annoying lesions by persistent treatment, not only till puberty has become well established, but until the age of twenty or twenty-five has been reached" (p. 167). He would even order "an alterative course with a little bichloride of mercury" (p. 160) in certain cases. In yet others, a bath may be employed, which "can only act by stimulating the skin to perform its functions more normally."

"More normally"! The phrase embodies the very essence of the fault described. It might serve for the shibboleth of every medical myope, for the physicians—unfortunately too many—who cannot rise above the poor level of mere prescribers of drugs. Compare for a moment the youths treated for an acne, "not only till puberty has become well established, but until the age of twenty or twenty-five," with the class represented by that young man, Marquette, who, dying of consumption, pushed his way through an unexplored wilderness to the Mississippi; or that other young man, Kane, who, despite his disease of the heart, braved the dangers of an Arctic winter! The diseases of the sebaceous glands truly do not belong to a family that kills. If the great Cæsar had dallied in Rome to be treated for the seborrhœa of the scalp that left bald the vertex of his imperial head, it may well be doubted whether he had ever conquered Gaul!

All said, however, Dr. Bulkley's book may be regarded as a useful and valuable addition to the literature of the subject upon which he has written at such length. The typography and proofreading are of the best.

J. N. H.

CLINICAL LECTURES.

ON SCROFULOUS NECK. By CLIFFORD ALLBUTT, M.A., M.D. Cantab., F.R.S., F.R.C.P.

ON THE SURGERY OF SCROFULOUS GLANDS. By T. PRIDGIN TEALE, M.A., M.B. Oxon., F.R.C.S. 8vo. pp. 32. London: J. and A. Churchill, 1885.

THERE are many ailments to which the human frame is liable which trench upon the departments both of medicine and surgery; and while it must never be forgotten that the careful surgeon will pay attention to the medical aspects of the cases under his care, there is much advantage in having the same subject treated from a medical and surgical point of view by men as eminent in their respective branches as these two well-known lecturers of Leeds.

Scrofula is one of those diseases which, often starting under the care of a physician, is, when developed, turned over to the surgeon as an external affection, although it has until lately received little but expectant treatment at his hands. But to Dr. Allbutt, a few years since, there presented itself the idea that the disintegrating scrofulous gland was an evil *per se*, exerting an evil influence upon its owner, and that when possible it should be removed. This radical measure, for it is far more than a mere evacuation of pent-up matter, has been, perhaps, thought of, and in some cases acted upon, by others, but was brought prominently into notice at the London International Congress by the recorded experience of the authors of these lectures. Indeed, these lectures, and especially the one by Mr. Teale, are but little more than an enlargement and reiteration of the views then expressed.

In the first one Dr. Allbutt, with many rhetorical flowers, makes clear his opinions upon the etiology and pathology of scrofulous neck. While not denying the existence of an inherited vulnerability of tissue, he is disposed to look upon scrofula as often a "deflection" from the normal, induced by external causes, under the influence of which an inferior healing power is manifested. The external causes are poor hygienic surroundings, under which the initial lesion is instituted and its continuance maintained. Chief among the primary affections thus induced, is what Dr. Allbutt speaks of as drain throat, being a pharyngitis produced by exposure to sewer gas, to which he thinks the rich are quite as much exposed as the poor, and which, in his judgment, accounts for the many scrofulous necks among those whose surroundings are otherwise excellent. Be this as it may, there can be no question that enlargement, and ultimately caseation of the cervical glands, is a frequent sequence to suppuration of the throat, and the indication is very clear to treat promptly and efficiently all such cases, and especially if the patient is one whose reparative powers are below the normal.

Dr. Allbutt calls particular attention to the importance of searching diligently for a peripheral irritation whenever glandular enlargement is noticed, pointing out that glands do not enlarge of themselves. We believe that if more close scrutiny were bestowed upon these cases, and were the well-known fact to which our author refers more constantly borne in mind, there would be many more cases in which, by the removal of the irritating cause, the early enlargement of the glands would

diminish and disappear; whereas if allowed to go on to caseation, unless the radical measure recommended in these lectures is resorted to, there remains nothing but long-continued suppuration, often leading to great, if not fatal, impairment of health. The evils of enlarged glands allowed to pursue their natural course undisturbed are threefold: A tedious malady attended by disfigurement; such an impairment of the general health as injures the patient's usefulness and enjoyment, and in many cases the inoculation of the system with the elements necessary for the development of phthisis.

For the avoidance of these evils Dr. Allbutt and Mr. Teale, with an increasing number of other practitioners, advise an early removal of the diseased glands; and their experience with the proceeding has been most favorable, resulting in comparatively speedy recovery from the operation, and great improvement of the patient's health.

Succinctly, and with most easily understood conciseness, Mr. Teale narrates his experience with the operation, and gives admirably suggestive hints for its proper performance. Mr. Teale illustrates his opinions by the same series of cases, watched to a conclusion in private practice, which he presented to the International Congress of 1881, merely adding that further experience has abundantly confirmed the views then expressed. Those views are, that wherever septic material exists in the system it should be removed; that in a majority of cases of enlarged cervical glands there is no evidence of constitutional taint, and that, therefore, surgical interference is demanded (*a*) whenever a sinus resulting from a degenerate lymphatic gland exists; (*b*) when pus is found connected with an enlarged lymphatic gland, or (*c*) when accessible glands exist in a patient in whom a caseous or suppurating gland has been found. When glands, which have not suppurated or undergone caseous degeneration, are an eyesore, or accompanied by ill-health, the question of their removal is an open one; but Mr. Teale inclines to think that in many cases "cautery-puncture," recommended by Treves, is the proper treatment, although he has had no personal experience with the measure.

Mr. Teale formulates several conclusions as to the surgical treatment of these cases. He thinks that surgery can secure the prompt healing of gland cavities and sinuses connected with them if the treatment is vigorous and thorough. His experience has taught him, as it has others, that the visible abscess is very often a mere collection of pus dependent upon a degenerate subfascial gland, which it is futile to incise unless the underlying gland is gotten rid of. Mr. Teale insists that when extirpation is resorted to, before the skin has become thinned, the wound heals well and with an insignificant scar, but that it is apt to be depressed if the operation has been long deferred, and resorted to only when there has been an open sinus discharging for months or years. When a sinus exists it should be dilated by a "Bigelow's dilator," its surface scraped, and any overhanging thin skin removed by scissors; but the surgeon should not rest until he has searched for and found the cause of the mischief—the degenerate gland, which will be often found underneath the floor of the abscess, connecting with it by a small aperture. This opening, often only large enough to admit a director, should be sought for, dilated sufficiently, and the gland scraped away with the spoon. When a gland has not suppurated, and is movable, it can be very easily enucleated, but when it has become caseous the difficulty of its removal is much

increased. In these cases the capsule should be incised and its contents removed by the spoon, the tough living stump of the gland adhering closely to the capsule, and often requiring the very vigorous use of the scraper, when it cannot be dissected away without risk to the adjoining tissues. Sometimes after the capsule is emptied a contiguous gland can be felt impinging upon the cavity. This should be reached by pricking through the wall of the cavity, and removed in the same manner. Having removed the gland or glands, Mr. Teale cleanses the cavity with a carbolized solution and charges it with iodoform. A drainage tube, reaching to the inmost recess, is fastened in, and the wound accurately closed with some absorbent antiseptic substance. When the gland and its capsule have been dissected out, the tube is removed at the end of a week and not replaced, but in other cases, the lecturer thinks, it is best to maintain drainage by a gilt wire kept in position until all but its own track is healed, which will ordinarily be in from three to ten weeks. In this matter of the drainage tube Dr. Allbutt and Mr. Teale are not agreed, the former cautioning against its continued use, as leading to the formation of a denser scar. Mr. Teale prefers Lister's scrapers as very superior to Volkmann's, the cup having a large oval, almost circular shape, and the double curve of the handles allowing the scoop to be swept round a cavity with better effect. Mr. Teale speaks highly of Dr. Bigelow's dilator, constructed on the principle of a glove-stretcher, as a very valuable instrument to enlarge sinuses in regions where the knife cannot be used safely. The remainder of the lecture is occupied with details of cases.

As we have said, the proceeding advocated in these lectures has attracted considerable notice and been adopted by many surgeons. Our personal experience with this mode of treatment has been too limited to enable us to speak with confidence of its merits, but it has been sufficiently satisfactory to lead us to give it a further trial in these cases, which have always been an opprobrium to both medicine and surgery. The proceeding is rational, in careful hands devoid of much risk, and, as recommended by such good authorities as the authors of these lectures, is worthy of an extended experimental test. S. A.

A System of Practical Medicine by American Authors. Edited by William Pepper, M.D., LL.D., assisted by Louis Starr, M.D. Vol II., General Diseases (Continued) and Diseases of the Digestive System. 8vo. pp. 1312. Vol. III., Diseases of the Respiratory, Circulatory, and Hæmatopoietic Systems. 8vo. pp. 1032. Philadelphia: Lea Brothers & Co., 1885.

The volumes of this great work succeed each other with a rapidity which does credit alike to publishers and editor. The second volume opens with the articles on "Rheumatism and Rheumatic Arthritis," by Dr. R. Palmer Howard, of McGill University, Montreal. The pathology of acute articular rheumatism is still in a most unsatisfactory condition, and as no one of the many theories fully meets the

problem of its origin, the author wisely contents himself with a mere statement of the views of various authorities. The nervous theory of Dr. J. K. Mitchell has again come into favor, and has found a powerful advocate in Jonathan Hutchinson. The author holds that there is in rheumatism more than a simple inflammation set up in an individual of a neuro-arthritic diathesis, and that a considerable part of the phenomena is due to perversion of the processes of assimilation and excretion, and to the presence of some unknown product of destructive metamorphosis. The clinical description of the acute affection is most ably drawn, every detail receiving careful attention, even to the minute subcutaneous nodules. The subacute articular, and the mono-articular, acute and subacute forms, receive separate consideration. In the section upon treatment, the use of the salicylates is discussed at length, and the author's conclusions may be thus summarized. The articular pain and the fever are more or less speedily removed. Relapses are more frequent, probably much more frequent, under this than the older modes; the salicyl compounds do not arrest or control the rheumatic inflammation of the endo- or pericardium, though on this point therapeutists are divided; hyperpyrexia is not always prevented; the average duration of the disease is not very materially lessened—indeed, there is some evidence that the salicylate treatment actually prolongs the time spent in hospital; and, lastly, there are often unpleasant or even serious effects from the use of the drug. In reading this careful analysis, in the preparation of which the whole range of medical literature has been laid under contribution, we confess to a feeling of sadness—another therapeutic dream dispelled! And ten years ago we were full of hope that in the salicylates a specific had been secured. However, we are daily gaining information as to the cases in which the salicylates are really valuable, and ascertaining the causes of failure. Dr. Howard favors a combination of the salicylates and alkaline treatment as likely to give better results than either of the remedies alone. And at the end of the section, after a careful consideration of the complications, a good summary is given of the plan of treatment which should be carried out.

The article on "Rheumatoid Arthritis" contains one of the best descriptions of this disease in its various aspects which has appeared, and will be read with much interest and profit by many to whom rheumatic gout or chronic osteoarthritis in its multiple forms has been a puzzling and vexatious disease.

The sections on "Muscular Rheumatism" and on "Gonorrhœal Rheumatism" are from the same pen. In connection with the latter, it is interesting to note that Fraser, of Edinburgh, has recently called attention to the complete failure of the salicylates in rheumatic cases with mucopurulent discharges from the genito-urinary tract, and alludes to this as an important and often unrecognized cause of failure of the drug.

Dr. W. H. Draper, of New York, writes the article on "Gout," a judicious, well-considered contribution, particularly strong in the section on medicinal and dietetic treatment. We are disappointed at not finding some special account of the disease in America, with regard to its frequency, the modifications, if any, which it has undergone, and the prevalence in different classes of the community. Acute gout is certainly a rare disease here, and heredity plays a very minor part in its causation. Even in the older cities, among members of the Brahmin class, to use Holmes's term, who for many generations have lived in comfort, the dis-

ease is not prevalent. We would attribute this fortunate immunity very largely to the habits of temperance in food and drink, but in part, also, it may be regarded as connected in some way with those ethnical changes which have converted the juicy and plethoric Briton into the dry and spare American. This seems borne out by a comparison of the records of admission for acute gout in the large hospitals in this country with those of the London institutions. To the latter the potmen of the public houses and the draymen of the breweries, who consume large quantities of malt liquors, are frequently admitted with the acute disease, which here is certainly very uncommon in persons of the same occupation. It is true that the consumption of spirits is greater here than in England, and the prevalence of gout in a country is closely related to the amount of fermented liquors consumed.

The chemical theory of gout has much to commend it; but, as Dr. Draper says: "It must be acknowledged that while a defective oxidation seems to be the essential factor in the production, it is impossible to reduce the process to the simplicity of a chemical equation." He puts the question clearly in affirming that heredity and the mysterious influence of the nervous system complicate the problem of the malnutrition which leads to gout in such a way, that while the general proposition may be maintained that gout is a disease in which suboxidation occurs, it is not possible to affirm whether suboxidation is the essence of the disease, or only one of its phenomena. The gouty dyscrasia with its cutaneous, bronchitic, digestive, and renal manifestations, is well considered under the term atonic gout. If we hold with Garrod that gout never exists without lithatic deposits, the irregular or anomalous forms are as rare here as the acute, but Dr. Draper takes safe ground in his treatment of this difficult subject, and holds that the constitutional vice may be responsible for many troubles without ever exciting specific gouty outbreaks. There is, perhaps, no disease so blinding to the judgment of practitioners as this same gout. There are men, eminent consultants, who see its manifestations in one form or another, in nine of every ten patients who enter their rooms. Particularly is this the case in London, where recently a work on the disease has been issued by one of these enthusiasts, who sees gout in an extensive range of affections, from the vulvitis of young girls to certain forms of meningitis!

The subject of "Rachitis" is dealt with by Dr. Jacobi, of New York, with whose views the profession is well acquainted. In many cases the original disposition to the disease is to be looked for in intrauterine life, as the existence of fœtal and congenital rickets has been fully established. After birth the most frequent cause is found within the diet or digestion of the patient. What it is precisely which acts injuriously and prevents the normal ossification processes is not determined. After carefully discussing the various statements, Dr. Jacobi concludes that they are not convincing except in one way; viz., "that both withholding and introducing certain ingredients, mainly lime, influence the growth of bone considerably." The clinical features, anatomical conditions, and the treatment are very fully considered.

For few diseases does the practitioner consult his library so seldom as for "Scurvy." Its almost total abolition from the category of maladies in civilized countries is one of the greatest triumphs of medicine in this century, and the name of Dr. James Lind, through whose exertions in the British Navy the world learned the practical lessons of prevention, should

ever be held in esteem. Dr. Philip S. Wales, of Washington, contributes a good practical article on this subject. From the U. S. Naval reports we gather that the disease is scarcely ever seen among the sailors, and on the U. S. Steamer "Jeannette," which spent two winters in the Arctic region, there was but one case of scurvy. Indeed there are now many more cases on land than at sea. Among the Italians who have recently come in such numbers to America and who are employed in railway construction, mines, and the coarser sorts of labor, scurvy is not uncommon. To economize, they live on very meagre fare and will not go to the expense of a varied diet. We hear also of cases among the Hungarians employed in the Pennsylvania coal mines.

In the article on "Purpura," Dr. I. E. Atkinson rightly doubts the existence of a distinct affection, and thinks that "it may eventually be proven that purpura, as we understand it, is merely a set of phenomena due to widely differing influences acting upon the blood and bloodvessels, and that the term will disappear from our nomenclature as indicating a disease, but will be preserved as denoting a symptom." Meanwhile, however, a consideration of the subject comes within the scope of a system of medicine. The affection is considered in its three important varieties: *purpura simplex*, *p. hemorrhagica*, and *p. rheumatica*. The etiology and pathology are carefully discussed, but we are still far from a satisfactory knowledge of the causes of the subtle changes in blood and vessels. Possibly the investigations of Petrone and Watson Cheyne on the occurrence of microbes in the bloodvessels may be in the right direction.

The subject of "Diabetes Mellitus" is ably considered by Dr. James Tyson, of Philadelphia, whose work on this disease is well known to the profession. The relations of glycosuria to irritative lesions of the medulla and the phenomena of the artificially induced condition serve as a basis for a very reasonable explanation of the disease, and not too much space is occupied by these problems. The author is inclined to attach more importance than he formerly did to pancreatic disease as a cause of diabetes. Certainly the number of cases in which this organ—usually so healthy—has been found affected is against the connection being accidental, and yet we do not remember any post-mortem record in which the solar plexus and ganglia have been found seriously involved. The sudden death in diabetes is usually with coma and is ascribed to acetonæmia, but it should be remembered that heart failure without any evidence of blood poisoning occurs in some cases. Upon what substances the diabetic intoxication depends has not been satisfactorily settled. It does not appear to be acetone, but is some, as yet unknown, product of the decomposition of sugar. The fat embolism theory has not been confirmed. A lipæmic state of the blood is more or less constant in diabetics, who are usually huge feeders, in whom the process of chylification is much prolonged, and we should say that a lactescent condition of the blood serum is normal in them. The sections on urine analysis and treatment are very complete.

In the present state of our knowledge it is a task of great difficulty to write a satisfactory article on "Scrofula." Dr. John S. Lynch, of Baltimore, has given a full exposition of the current views, but, on the relation of tuberculosis to scrofula there is a turbidity peculiarly in keeping with this troubled subject. He holds, very correctly, that scrofula is not a disease *per se*, but merely a condition resulting from

malnutrition and faulty construction of the tissues, and no peculiar anatomical lesion can be ascribed to it, but "the scrofulous are more likely than others to have tuberculosis: 1st, because of their greater susceptibility to all morbid influences; 2d, because the scrofulous processes are apt to produce some cachectic condition which is always a condition precedent to tuberculosis; and, lastly, because the products of decay resulting from the scrofulous processes may enter the circulation and directly produce the tuberculous dyscrasia;" which is to say that the products of a process (scrofula) without any distinctive anatomical lesion can excite a specific affection such as tuberculosis; and yet in a previous paragraph is the statement "that a belief in the identity of the two diseases seems to be no longer tenable." There seems to be little doubt that many of the conditions which we speak of as scrofulous are in reality tuberculous, as shown by that most characteristic of tests, inoculation, and so far the processes are identical, but there are other conditions often spoken of as scrofulous, catarrhs, eczemas, ophthalmias, and the like, which are not necessarily tuberculous. We should understand by the word, not a disease, but, as Dr. Lynch says, "a condition resulting from malnutrition and consequent faulty construction of the tissues" in which all lesions are characterized by chronicity and intractableness. Of the lesions to which individuals of this constitutional disposition are prone, tuberculous are among the most common. Professor Fitz puts it very tersely when in his article in Vol I. of this System he says, "The scrofulous person is frequently tuberculous; the tuberculous person is usually scrofulous; the non-scrofulous person, however, may die of tuberculosis, while the individual may be scrofulous without containing tubercle."

"Hereditary Syphilis," which is considered by Dr. J. William White, of Philadelphia, is certainly a disease which concerns the general practitioner more than the special surgeon; and, as Dr. White says, it is in every way proper that the condition should receive *some notice* in a system of general medicine. If an exhaustive article, extending to between sixty and seventy pages, is what the author would designate by that term, we should like to know his ideas of a *monograph;* but we must hasten to say that there is not a page too much, and the article stands as perhaps the most exhaustive, as it certainly is one of the best, contributions to the subject in the English, or, indeed, in any, language. We have not space for the discussion of any of the interesting problems connected with this disease, and can only refer to one or two of Dr. White's conclusions. On the important question of the marriage of a syphilitic, he holds with Hutchinson, Fournier, and others, that after an interval of not less than four years, and after thorough specific treatment, a person may be permitted to marry, and in the majority of cases the danger of transmission is then quite trifling. The disease may be inherited from either parent, or from both, and the nearer the time of conception to the date of their infection the greater the probability that this will occur. It is very likely, though hardly proven, that when a child becomes syphilitic through paternal influence, the mother is also the subject of syphilis. The disease may be transmitted to the child from the mother even when it is acquired by the latter as late as the seventh month of utero-gestation. The pathology and symptoms of the various manifestations in the child are detailed at length, and the careful references and footnotes show a wide acquaintance with the labors of European and American syphilographers. In the section on syphilis of the teeth, the author states his

concurrence in the views of Mr. Hutchinson of the specific character of the changes in the upper (permanent) central incisors, and he rightly emphasizes the special points as originally laid down by the distinguished London surgeon, which many writers appear to have overlooked.

In the treatment of the disease in infants, Dr. White advises the administration of mercury by inunction spread on the flannel roller, as recommended by Sir Benjamin Brodie.

The editor, in his preface, says that he has compelled the omission, among other things, of numerous references, and while we must allow that too numerous foot-notes disfigure and encumber the pages, we are glad that in Dr. White's paper the editorial rule was honored in the breach, for in the copious references the interested reader will find much which adds to the value of this most able article.

The greater part of the second volume is taken up with a consideration of Diseases of the Digestive System.

Dr. J. Solis-Cohen contributes the articles on "Affections of the Mouth and Tongue, of the Tonsils, of the Pharynx, and Œsophagus." The sections on the mouth and tongue are very exhaustive; that on morbid dentition will be read with profit by many practitioners. In discussing the diseases of the tonsils, a more extended notice of follicular or lacunar tonsillitis would have been appropriate, considering its great frequency, and the mistakes in diagnosis which are daily made. The affections of the œsophagus are treated of at length.

"The Functional and Inflammatory Diseases of the Stomach," by Dr. Samuel G. Armour, of Brooklyn, are considered under the sections Functional Dyspepsia, Cardialgia, Acute Gastritis, and Chronic Gastritis. We miss a consideration of nervous dyspepsia, so called, which has been so much discussed of late; but the articles form valuable and practical contributions to some of the commonest diseases which the practitioner is called upon to treat.

The remaining affections of the stomach are dealt with by Professor Welch, of Johns Hopkins University, Baltimore. The articles on "Ulcer of the Stomach" and on "Cancer of the Stomach," are in many respects the most complete which have been written on these subjects, forming exhaustive monographs in which every detail has been carefully considered. The entire range of medical literature has been ransacked, and new statistics have been prepared from a very large series of collected cases. The sections on symptomatology, diagnosis, and treatment, leave nothing to be desired. It is not too much to say that these articles of Professor Welch are the most striking in the volume; in fulness of detail, in order and arrangement, in careful and judicious criticism they are models, and for reference in so many of the obscure problems which arise in these cases they will be storehouses of information for the perplexed physician. Other articles by the same author are upon "Hemorrhage from the Stomach, Dilatation of the Stomach, and certain Minor Organic Affections of the Stomach."

Dr. W. W. Johnston, of Washington, writes the papers on "Intestinal Indigestion, Constipation, Enteralgia, Acute Intestinal Catarrh, Chronic Intestinal Catarrh, and Cholera Morbus." Of these, the articles on intestinal indigestion and chronic intestinal catarrh deal very fully with subjects which have not received from systematic writers the attention they deserve; all are carefully prepared and valuable contributions to a common and important group of affections.

An extended article, by Dr. J. Lewis Smith, of New York, on "Intestinal Affections of Children in Hot Weather," is a valuable addition to the volume. The terrible mortality among young children from diarrhœa during the summer months, is one of the most remarkable features of the death returns in all our large cities. The entero-colitis which is responsible for a majority of the deaths, does not seem to be directly due to great heat, but the cause must be looked for in that state of the atmosphere engendered by heat where unsanitary conditions prevail. What the nature of the agent is has not yet been determined; the mycotic theory has not been proved. That diet is an important factor in the disease, every physician is aware. Cholera infantum, the most severe and acute form of the summer complaint, still awaits, like the cholera morbus of adults, a suitable explanation of its phenomena. Dr. Smith combats the view that it is identical with thermic fever, and believes it to be of an inflammatory nature. The treatment of these affections is considered very fully, and the reader will find an interesting discussion of the question of infant feeding, which has so important a bearing on the prevention of these complaints.

Dr. Wales, of Washington, has contributed an article on that curious affection which is more common than the text-books state, viz., "Pseudo-membranous Enteritis." The view taken of the origin of these membranous exudates from the muciparous glands (Lieberkühn's) of the large bowel, is undoubtedly the correct one. We have seen the greater portion of the colon covered with just such a tenacious coherent membrane. Woodward's account of the disease in the *Medical and Surgical History of the Rebellion* is most excellent, particularly in the historical and anatomical details. Oddly enough, it is not referred to in this article. The connection of the affection with hysterical and nervous trouble remains inexplicable.

Dr. James T. Whittaker, of Cincinnati, contributes an important series of articles on "Dysentery, Typhlitis and Perityphlitis, Intestinal Ulcer, and Hemorrhage from the Bowels."

The admirable historical sketch which prefaces the account of dysentery reminds us what an important part this disease has played in all ages, and in the great wars of the world its victims have numbered more than those slain in battle. The Civil War furnished American physicians with unexampled opportunities for the study of the disease, and resulted in the publication of the most extensive work on the subject ever published (second volume of *Medical and Surgical History of the War of the Rebellion*), which, as Dr. Whittaker justly remarks, is a lasting monument to the labor and learning of its author, Joseph J. Woodward. Our knowledge of the etiology of the disease is in a most unsatisfactory state, and "the prospect of reconciling the accumulated discordant facts is very discouraging." The evidence in favor of contagion is, in some cases, too strong to be ignored, but the existence of a specific germ has not yet been determined, and it is held that at the present time dysentery must be regarded as a malady which stands in closer relation to, or finds a better analogue in, cholera than typhoid fever." In the treatment of this most painful disease irrigation of the large intestine and the thorough flushing out of its contents seem the most natural plan. The author strongly recommends the large nitrate of silver (℈j–Oj) injections as used by H. C. Wood and Stephen Mackenzie. The chapter on the affections of the cæcum and appendix—typhlitis,

perityphlitis, and paratyphlitis—is a practical contribution to diseases too often overlooked or mistaken by the practitioner. We object to the term paratyphlitis as a very unnecessary refinement. It is sufficient to use the term perityphlitis to embrace all the cases in which the inflammation extends beyond the coats of the bowel, and in many instances this is at a point where they are not covered with peritoneum.

The subject of "Intestinal Obstruction" is considered by Dr. Hunter McGuire, of Richmond. After a tolerably full description of the various conditions which induce acute and chronic obstructions, the important question of differential diagnosis is discussed, and the general principles laid down for guidance in distinguishing the important varieties. The necessity for prompt surgical interference is insisted upon as soon as it is recognized that the acute obstruction is not due to enteritis or peritonitis, but to some mechanical cause. This article has suffered, probably, as have some others, from a prolonged stay in the hands of the editor, and a reference to the numerous recent contributions to the surgery of the intestinal obstructions would have added to the value of the article.

Dr. I. E. Atkinson, of Baltimore, in a brief chapter, deals with "Cancer and Lardaceous Degeneration of the Intestine."

The section on "Diseases of the Rectum and Anus," by Dr. T. G. Morton and Dr. Henry M. Wetherill, of Philadelphia, comprises a miscellaneous assortment of affections, most of them surgical, and quite out of place in a system of medicine. The editor would have done well to remember that a practitioner who would adorn his library with these volumes would certainly have a text-book of surgery. The more strictly medical conditions of the anus and rectum are far too briefly considered, particularly their relation to spinal disease.

Dr. Leidy contributes the article on "Intestinal Worms." He agrees with other authorities that the tænia saginata, or beef tapeworm, is the most common, and states that of about fifty specimens sent to him during the past twenty years all have appeared to belong to this species. He has recently put on record another case of the tænia flavo-punctata.

An excellent account of "Trichinosis" comes very appropriately from the discoverer of this formidable parasite in the hog. A brief description of human parasites other than intestinal, is also given under their classified orders.

The extensive division upon "Diseases of Liver" is contributed by Dr. Roberts Bartholow, of Philadelphia. Under functional disorders there are short practical chapters on "Biliousness," "Lithæmia," "Hepatic Glycosuria," and "Jaundice." In the article on "Interstitial Hepatitis," or "Sclerosis," as Dr. Bartholow would rightly call it, instead of cirrhosis, we have simply a reference to the fact that several forms of the disease are recognized by French writers, but there is no special description of the hypertrophic form, which seems to be a well-established variety, nor of the fatty cirrhotic liver, upon which there have been several recent French memoirs and which is a very common condition. The section on "Biliary Concretions" is very complete, but upon treatment we miss a statement or summary of the results of cholecystotomy. The writer is sanguine on the subject of the solution of calculi in the gall-bladder, and thinks that facts are known which justify the belief that an impression may be made upon them. The use of the phosphate of soda in drachm doses three times a day has proved effective in his

hands. The plan of injecting the gall-bladder with solvents, Durande's remedy or chloroform, is suggested.

The assistant editor, Dr. Louis Starr, gives a full account of the "Diseases of the Pancreas," the various affections being considered at greater length and in more detail than is usual; not more, however, than they deserve, for, in reality, the acute and chronic processes in this gland play an important part in abdominal disease, and these carefully prepared papers will, we hope, do something toward directing the attention of physicians to a more earnest study of the diseases of this organ.

The article on "Peritonitis," by Dr. Alonzo Clark, of New York, is an interesting one in many respects, particularly in regard to the opium treatment of the disease, for the introduction of which the profession is indebted to the veteran writer of the paper. He shows very clearly that although Graves and Stokes had both written upon the use of this drug in peritonitis, it had not been generally adopted, and it was not until after 1840 that its great value was recognized. The account which Dr. Clark gives of his early experience forms a very instructive chapter in the history of therapeutics.

An able essay on "Diseases of the Abdominal Glands" (tabes mesenterica), by Dr. Samuel C. Busey, of Washington, concludes the volume.

The index of 118 pages is bewildering in its fulness. On certain of the pages, by adding about half as many words a very readable summary or abstract can be obtained. There are a good many typographical errors, particularly in the footnotes and references.

The third volume is devoted to "Diseases of the Respiratory, Circulatory, and Hæmatopoietic Systems."

The articles on the affections of the upper air-passages are contributed by well-known specialists. Dr. Seiler, of Philadelphia, writes on "Laryngoscopy and Rhinoscopy;" Dr. Harrison Allen, of Philadelphia, on "Diseases of the Nasal Passages;" the late Dr. Elsberg, of New York, on "Diseases of the Larynx and Diseases of the Trachea;" Dr. Lefferts, of New York, on "Tracheotomy." Dr. Hosmer A. Johnson, of Chicago, writes on the "Neuroses of the Larynx," and Dr. Jacobi, of New York, on "Acute Catarrhal Laryngitis and Pseudo-membranous Laryngitis."

The "Diseases of the Bronchi" are considered by Dr. N. S. Davis, of Chicago. Contrary to the accepted opinion, he holds that the largest number of cases of bronchitis occur between the ages of ten and thirty years. The statistics of mortality are deceptive, as in more than half the cases reported under the head of bronchitis the fatal result is due to extension of the disease to the lungs. The different forms of the affection are considered under the divisions of acute, mechanical, capillary, rheumatic, pseudo-membranous, and chronic bronchitis. The etiology and symptoms of these varieties are considered separately, and the morbid anatomy and treatment considered together, which is not a very satisfactory plan. Scarcely space enough is devoted to such an important disease as capillary bronchitis. The writer appears to lay great stress on the rheumatic variety, but does not mention gout in connection with chronic bronchitis. Indeed, the consideration of this latter form is exceedingly meagre.

Dr. Geddings, of Aiken, South Carolina, writes the articles on "Bronchial Asthma" and "Hay Asthma." We naturally turned with interest to the latter paper to ascertain the author's views upon this much discussed

disease, but we were much disappointed not to find a fuller statement of the more recent and most important investigations of American physicians. The conclusion at which he arrives is expressed in the following paragraph:

"The experiments of Blakely justify the belief that the cause of the early form of hay fever which prevails in England is to be found in the pollen of a number of plants, particularly grasses and grains, which bloom in the late spring and early summer, while those of Marsh prove conclusively that the ambrosia artemisiæfolia or Roman wormwood, is certainly one, and probably the chief cause of the American or autumnal form of the disease."

Very scant justice is done to the labors of Daly, Roe, Allen, and J. N. Mackenzie, who have done so much to make clear the etiology of this troublesome affection. The pollen theory will doubtless continue to have its advocates, but it is daily losing ground, and the cure of the affection by local measures and by remedies which act on the nervous system is the most convincing proof of the correctness of the new views—*naturam morborum ostendunt curationes.*

Dr. Samuel C. Chew, of Washington, contributes four papers on "Dilatation of the Bronchial Tubes; Emphysema; Collapse of the Lung; and Congestion and Œdema of the Lungs," which are good practical expositions of our knowledge on these subjects.

Dr. William Carson, of Cincinnati, writes the articles on "Hæmoptysis," "Pulmonary Apoplexy," "Abscess of the Lung," and "Gangrene of the Lung." The first of these is a very valuable contribution, and presents a most careful and extensive analysis of all the facts relating to the subject. Among the statistical details we would have liked to see reference to the frequency with which hæmoptysis occurs in persons who do not become phthisical. Such figures are probably not available, but every practitioner can call to mind cases in which, after repeated hemorrhages no ill effects followed, and the patients have for years after remained free from pulmonary troubles.

The article on "Croupous Pneumonia" is from the pen of Dr. Alfred L. Loomis, of New York, and is an able clinical delineation of the disease. It is regarded as an acute, general disease, with a local manifestation. Some interesting facts are given to show that in New York the disease is on the increase. The infectious and epidemic characters are very briefly considered, and one looks in vain for some statement of the relations of microörganisms to the disease. The section on treatment contains much sound and judicious advice which we would earnestly commend to practitioners; there is still a great deal of meddlesome and unnecessary medication in pneumonia.

The editor, Dr. Pepper, contributes the article on "Catarrhal Pneumonia." The account of the morbid anatomy is very clearly drawn, but we gather that Dr. Pepper, the writer, still maintains the older views of the relation of this disease to phthisis, for he says "the presence of the degenerate cheesy foci, associated with alveolar and peribronchial thickening, may lead to catarrhal phthisis with or without true tuberculous formations." And elsewhere, in emphasizing the importance of the close and complicated connection between catarrhal pneumonia in its various types and subsequent organic diseases, he puts the relationship as follows:

"There may be a development of acute general miliary tuberculosis, owing to the depressing and irritating effects of the disease upon a constitution

strongly predisposed to tuberculosis, or tuberculous pulmonary phthisis may ensue, either directly as a complication or as a sequel to ulcerative changes of an inflammatory nature in the lungs. Finally, those who have passed through an attack of catarrhal pneumonia are usually left with such vulnerability of system that any predisposition to phthisis or tuberculosis is very apt to be readily called into activity."

Far too much space is occupied with the subject of "Pulmonary Embolism," by Dr. Beverly Robinson, of New York. It is a most exhaustive article upon a comparatively rare affection, but it scarcely accords with our sense of the proportion of things for the consideration of such a subject to occupy about the same number of pages as such an important disease as bronchitis.

What better guarantee for truth have we than the wisest men's acceptance of it? That the views of Koch upon phthisis should have so rapidly made headway against established doctrines, until now the adherents number the great majority of working pathologists and clinicians, is strong presumptive evidence in its favor.

In this country Dr. Austin Flint was one of the first to advocate the parasitic theory, and the weight of his authority and writings has done much to further it. His article upon "Phthisis," in this volume, is written from the standpoint of a unicist, and the morbid product which distinguishes pulmonary phthisis is regarded as tuberculous. The names denoting a non-tuberculous form, as catarrhal pneumonia, chronic bronchopneumonia, etc., have shared the fate of the theory upon which they were based. The writer's views on this point, to which alone we can refer, are freely expressed in the following paragraphs:

"The name acute pulmonary tuberculosis denotes an affection which may be sharply separated from the chronic forms of pulmonary phthisis. The acute affection is characterized by the presence, exclusively or in great abundance, of miliary tubercles. It runs a rapid course, and the symptoms are those of an acute disease. The name phthisis implies a chronic affection. In a small proportion of the cases of pulmonary phthisis, miliary tubercles become developed in great abundance. In these cases acute pulmonary tuberculosis supervenes upon chronic phthisis. These cases, by those who regard phthisis in its ordinary form as a non-tuberculous affection, were designated cases of tuberculous phthisis. The fact that in cases of phthisis there is a liability to the supervention of miliary tubercles as abundantly as in cases of acute tuberculosis, is to be borne in mind, but it does not seem necessary to make a distinct variety of the disease on the basis of this fact. In some cases of pulmonary phthisis, the tuberculous product is notably large at the outset, and destructive changes in the lungs go on continuously with unusual rapidity. To these cases the name phthisis florida and galloping consumption have been applied."

It is accepted as established that the bacillus tuberculosis is always present in tuberculous products, and as uniformly absent in other morbid products, and

"that it is generally present in the sputa of phthisical patients and never present in the sputa of non-phthisical patients, and that the tuberculous disease in animals may be produced by inoculation with this organism after cultivation has been sufficiently continued to eliminate all else pertaining to the tuberculous product. On these data are based the conclusions that phthisis is an infectious disease—in other words, that it involves in its causation a specific agent capable of self-multiplication; that it is a communicable disease, and that the agent of the communication is the bacillus tuberculosis—that is, this agent is the contagium."

Dr. Edward T. Bruen, of Philadelphia, contributes the articles on "Syphilitic Affections of the Lungs," "Pneumonokoniosis," "Cancer of the Lungs," "Pulmonary Hydatids," and "Diseases of the Mediastinum."

"Syphilitic Phthisis" is a curious affection in its distribution. Subjects of it are quite numerous at the clinics and in the private practices of some observers, notably Pancritius, of Berlin, and Porter, of New York, while others seek for years, and often in vain, for a case, alive or dead, for demonstration and study. Dr. Bruen states that the question of the existence of a recognizable pulmonary syphilis "remains, even now, but partially removed from the field of debate and conjecture." In the diagnosis no mention is made of the importance of the presence or absence in the sputum of the bacillus tuberculosis.

In the article on "Pneumonokoniosis," speaking of miners' phthisis in England, Dr. Bruen has got his geographical and geological knowledge badly contorted. The sections on cancer of the lung and diseases of the mediastinum are carefully prepared articles. On the subject of "Pulmonary Hydatids" the writer has scarcely grasped the facts relating to the life history of the parasite, for he says, "like the latter (the cysticercus) *the larvæ infest the bowels of certain animals;*" and, again, he says that "pulmonary hydatids may occur as primary formations in the lungs, but may be *secondary to similar growths elsewhere, especially in the liver.*"

Dr. John S. Lynch, of Baltimore, writes the article on "Acute Miliary Tuberculosis," and his paper is a good practical exposition of our knowledge of this disease.

"The Diseases of the Pleura" are considered by Dr. Frank Donaldson, of Baltimore, in an extensive article of more than one hundred pages, replete with valuable pathological and clinical information. In discussing the subject of paracentesis, "liberal use has been made of a valuable communication specially prepared by Henry I. Bowditch for this purpose, and embodying the mature result of his study and experience." The writer affirms, and we fully agree with him, that to Bowditch, in conjunction with Wyman, is due the great credit of introducing the principle of aspiration, and also to a great extent it was through his persevering and skilful advocacy and performance of the operation that it became so firmly established in America upon a true, scientific basis. We regret that space does not permit us to refer to many interesting points in the section on purulent pleurisy.

"The Diseases of the Circulatory System" occupy only two hundred and fifty pages, and seem rather too briefly considered. Certainly, in comparison with the articles in Reynolds's *System of Medicine*, they are very short, not occupying much more than one-third the space. A closer comparison shows very clearly that it is not alone in length that the American articles are behind those of the English work. But this could have been predicted, for the section on the circulation in Reynolds's *System* is exceptionally strong, and the articles of Peacock, Sibson, Fagge, and Gowers, are perhaps the ablest contributed to that work.

The section on "Diseases of the Substance of the Heart" is written by Dr. William Osler, of Philadelphia, and contains a practical—but in places rather brief—exposition of the various conditions. We scarcely see why, except to follow customary usage, fibroid heart should be considered as a myocarditis. It is doubtful whether inflammation enters into

the process, and it is, strictly speaking, a degeneration. The interesting observations of Leyden, Martin, Welch, and others, have of late directed greater attention to the changes in the muscle substance, and the influence of arterial disease in inducing the degenerations. From these sources the writer seems to have obtained much valuable information.

Dr. Loomis, of New York, contributes the article on "Endocarditis and Cardiac Valvular Diseases." He prefers the terms exudative, ulcerative, and interstitial to designate the forms of endocarditis. The micrococci in the ulcerative condition are probably "developed by the septic ulcerative process rather than that they are the cause of such processes."

The affections of the various orifices are taken up *seriatim*, and the etiology, symptoms, and differential diagnosis considered.

In estimating the prognosis in valvular defects, the writer is of opinion that the loudness, harshness, and the area of diffusion of any cardiac murmur have very little to do with it. The murmurs rarely constitute a bad prognosis, unless hypertrophy and dilatation coexist. His experience seems to show that sudden death is almost as frequent in mitral stenosis as in aortic insufficiency, but the figures are small from which this conclusion is drawn. The advice upon treatment is brief but carefully prepared. No mention is made of the proposed substitutes for digitalis or of Oertel's plan of treatment by muscular exercise. The article, in fact, is a statement of Dr. Loomis's experience and views, and not an extensive monograph.

The papers on "Cyanosis and Congenital Anomalies of the Heart and Great Vessels," by Dr. Morris Longstreth, of Philadelphia, and "On Cardiac Thrombosis," by Dr. Beverly Robinson, of New York, are, proportionately to the importance of these subjects, the most extensive among the heart articles. Dr. Longstreth has entered at great length into the question of the anomalies, and his contribution will be of great value as a work of reference. We would have been better pleased had there been a few good illustrations, without them the description is apt to get monotonous.

Dr. Robinson's article is the most exhaustive on the subject in the English language. He divides the cardiac concretions into cadaveric, terminal, and ancient clots. It is curious, in such an elaborate review of the subject, not to find more extended notice of the free globular concretions (kugelthromben) which are usually single, and found in the dilated left auricle of mitral stenosis. The only mention is of a case of Pitres, in which the small globular concretions were found free in all the cavities of the heart.

Dr. Austin Flint writes the article on "Neuroses of the Heart," in which he considers first certain fundamental disorders and then angina pectoris and exophthalmic goitre. Angina is believed to depend upon ischæmia of the heart due to lesions of the coronary arteries. The sensory fibres of the cardiac branches of the pneumogastrics are believed to be the seat of the pain. Scarcely sufficient attention is given to the pseudo-anginal attacks and to the points of distinction between them and the true disease.

The "Diseases of the Pericardium" are treated of by Dr. J. M. Da Costa, of Philadelphia. The article on acute pericarditis is a valuable clinical contribution in which the general symptoms and diagnosis are sketched with great fulness. The rheumatic affection when unaccompanied with high fever usually runs, in the writer's experience, a favor-

able course, but where a complication of Bright's disease exists the prognosis is most unfavorable.

Dr. John B. Roberts writes a supplementary article on the "Operative Treatment of Pericardial Effusions," which will form a useful guide for practitioners, and will, we may hope, increase the frequency with which paracentesis is performed in cases of very copious effusions.

The "Diseases of the Aorta" are considered by Dr. G. M. Garland, of Boston. The symptoms of thoracic aneurism are fully given and the differential diagnosis clearly drawn. The section on treatment embraces a discussion of all the methods which have been advised.

The "Diseases of the Coronary, Pulmonary, Superior Mesenteric, Inferior Mesenteric, and Hepatic Arteries, and of the Cœliac Axis" are briefly described by Dr. E. G. Cutler, of Boston. The article on embolism of the superior mesenteric artery is very interesting, and this condition may be more frequent than the text-books lead us to suppose.

Dr. Andrew H. Smith writes the articles on "Diseases of the Veins" and on the "Caisson Disease." Our knowledge of this latter is largely due to the careful observations of Dr. Smith. He still adheres to the vascular and congestive theory in explanation of the phenomena of the disease and affirms that the beneficial effect of ergot in his hands is strong corroborative evidence of the truth of his views.

The section on "Diseases of the Blood and Blood Glandular System" is contributed by Dr. William Osler, of Philadelphia. The general pathology of Anæmia is discussed and there are brief articles on Plethora, Chlorosis, and Melanæmia. That on Chlorosis is too short when we consider its importance and the frequency with which cases occur. In the introductory section on the histological characters of the blood there is an extraordinary mistake in the number of white corpuscles per cubic millimetre, which is stated to be from "eight to fifteen millions!" The chapters on Leukæmia, Hodgkin's Disease, and Pernicious Anæmia present full statements of the recent views on these interesting affections. In the article on Hæmophilia full justice is done to the labors of American physicians who first described the disease. Gould's chart of the Yeaton family, which was published some years ago in the *Boston Med. and Surg. Journal*, is given, and it illustrates well the curious heredity in this most curious affection. Addison's disease and the various affections of the suprarenal capsules are also considered by this writer.

Dr. I. E. Atkinson writes the article on "Diseases of the Spleen," and gives a detailed description of the numerous pathological conditions.

Dr. D. Hayes Agnew, of Philadelphia, contributes the article on "Diseases of the Thyroid Gland," and Dr. Samuel C. Busey, of Washington, the concluding article on "Simple Lymphangitis."

INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. AUTHORS AND SUBJECTS. Vol. VI. HEASTIE-INSFELDT. 4to. pp. [11] 1051. Government Printing Office: Washington, 1885.

No better analysis of this volume can be laid before our readers than that furnished by Dr. Billings in his official preface addressed to Surgeon-

General Murray. By it we learn that the author-titles contained in the sixth volume amount to 7900, representing 2543 volumes and 7250 pamphlets. It also contains 14,590 subject-titles of individual books and pamphlets, and 32,290 titles of articles in various periodicals.

The value of this catalogue has been again and again dwelt upon in these pages, so that, beyond reiterating former statements, there is little more that we can say. But, while glancing over the pages of vol. vi., we have been struck with one use that it can be put to different from that which belongs to most books, namely, to show men the very limited range of their knowledge. We have been humbled to find how little we know of purely professional literature, and this fact has been brought home to us by finding the name of Joannes Ernestus Hebenstreit displayed upon nearly two pages of the catalogue, by the titles of the works he wrote. It may be a sad confession to make, but we are compelled to admit that we had never heard of John E. Hebenstreit; and, had it not been for the labors of Dr. Billings and his coadjutors, both the author and his works would have remained buried in oblivion, so far as we are concerned. But now both we and our readers will be enabled to prate wisely of one who wrote so largely during the middle of the last century, and who gave his writings to the world through the famous press of Leipsic. Did our name appear even in one small corner of this great book, we should be proud; but how slight would be our claim to immortality alongside of John Hebenstreit! Indeed, we are inclined to envy Alexander Heastie, who wrote of yellow fever in 1830, and Joannes Carolus Insfeldt, who discoursed *De lusibus naturæ* in 1772, for the one begins this volume, while the other terminates it, so that no one will glance at the title-page and fail to know that such men lived.

The same plan upon which the other volumes of the Index-Catalogue were constructed has been pursued in this one, and, as the work progresses, its magnitude and importance must impress every observer. Again, we would congratulate Dr. Billings on the successful progress of the work; again would we utter the hope that Congress will make such suitable appropriations as will permit of a more speedy issue of the remaining volumes. S. A.

RECENT EDITIONS OF WORKS ON DISEASES OF THE EAR.

THE EAR; ITS ANATOMY, PHYSIOLOGY, AND DISEASES. By CHARLES H. BURNETT, A.M., M.D. Second edition, revised and rewritten. 8vo. pp. 585. Philadelphia: Henry C. Lea's Son and Co., 1884.

A PRACTICAL TREATISE ON THE DISEASES OF THE EAR. By D. B. ST. JOHN ROOSA, M.D., LL.D. Sixth edition, revised and enlarged. 8vo. pp. xxii. 718. New York: Wm. Wood & Co., 1885.

THE increase in the knowledge of the etiology and treatment of diseases of the ear has been steadily augmenting during the past fifteen years, and that the literature of the subject is becoming correspondingly voluminous is attested by the bibliographical appendix to the last volume of *Transactions of the American Otological Society*, which gives

more than six hundred titles of books and papers as the sum of contributions during the year ending July 1, 1885. The revision of such a mass of material, its condensation, and the selection of the more important parts, render the compilation of a text-book no light task, and of such work, requiring intimate knowledge of the subject and its literature, as well as considerable powers both of discrimination and generalization, the books here briefly reviewed are excellent examples.

In the seven years which have elapsed since the publication of the first edition of DR. BURNETT'S Treatise on the Ear, there have been sufficient advances in the science of otology to demand considerable alterations in the original text, and indeed an entire revision of certain portions of the work, among which may be enumerated the chapters on Abnormalities of the Auricle, Otomycosis, Treatment of Chronic Otorrhœa, Classification and Treatment of Aural Polypi, and Diagnosis, Etiology, and Treatment of Aural Vertigo. The bulk of the volume in this second edition is not apparently increased, and Dr. Johnson's aphorism, that "books you may hold readily in your hand are the most useful after all," remains good; but in point of fact, by change in type and in leading each page, shows an increase of from fifteen to twenty per cent. of material, and by the entire omission of parts of the first edition which had become obsolete, space has been afforded for new and original matter.

In view of the general acceptance of the work of Dr. Burnett as a text-book, a review, such as might have been appropriate to the first edition, would be superfluous, and in justice to the reader all that is required is a notice of such changes as have made the newer edition necessary.

In the chapters on Anatomy and Physiology, Dr. Burnett has made no material changes, except in the addition of the investigations of Bigelow and Sapolini upon the chorda tympani as a distinct nerve, and in the substitution of some new and better illustrations, as, for example, figures 7 and 8, the outer and inner surfaces of the left temporal bone, and figure 26, the diagrammatic representation of the formation of the so-called pouches of the membrana tympani; these are original and published for the first time, as is also figure 48, drawn from a preparation by the author, and exhibiting a section of the complete auditory apparatus. In the chapter on Malformations and Diseases of the Auricle, figures 73, 74, 75, and 76, and the accompanying text, are also new. In the treatment of circumscribed and diffuse inflammation of the external auditory canal, especial mention is made of the administration of the sulphide of calcium, which the author has found of decided benefit in one-tenth grain doses, three or four times daily, in furunculosis, and of aspiration by means of Siegle's pneumatic speculum, and the insufflation of drying powders in diffuse inflammation; the principle of aspiration, applied to the humid and sluggish parts, being found not only to cleanse them, but also to stimulate them to healthy activity; the form of powder blower used is an ordinary quill cylinder with flexible rubber-tubing.

Dr. Burnett's previous observations on the subject of otomycosis give an especial value to anything that he may have to say in regard to parasitic growths in the ear, and comparison of the pages thereto relating in the first and second editions shows that in addition to the substitution of original drawings in illustration, the text has been largely rewritten; in regard to treatment the author says, "Until within a year or two, I had

always employed, as a germicide in these cases, alcohol, either pure or diluted with water. The destruction of the parasite is most easily and efficiently accomplished by thoroughly filling the fundus of the canal, and all other parts of the external ear affected by the growth of the fungus, with powdered boric acid, borax, or boric acid in combination with chinoline salicylate (one of the latter to sixteen of the former). An ear affected with aspergillus should be seen every day by the surgeon, who alone should syringe it, and thus remove the loosened portions of the membrane; after the ear is thus cleansed a fresh insufflation should be made. Alcohol is undoubtedly an efficient parasiticide, but it does not act as rapidly as the powders named, it is not as easily applied, nor is its use in the ear free from discomfort to the patient; the less dependence placed upon fluid applications in these cases the better."

The articles on seborrhœa and pruritus auris, on displacement of the auricle for removal of foreign bodies and on reflex ulceration in the auditory canal, are new in this edition, and the observations on the latter subject are, we believe, original with the author; other new material, to which attention may with advantage be directed, is given as follows: p. 302, sebaceous tumors of the canal; p. 312, fracture of tympanic bone; p. 313, vicarious menstruation and abscess of the membrana tympani; pp. 321 to 339, comprise a previous paper on perforations of the membrane of Shrapnell, revised and extended; p. 345, vascular tumor, moles, and hæmatoma of the membrana tympani; p. 389, syphilitic disease of the middle ear; p. 409, accumulation of sero-mucus in the tympanic cavity; p. 421, objective snapping noises in the ear, with account of a peculiar case of "clicking sounds" in the ears traced to muscular spasm in the upper fibres of the superior constrictor of the pharynx; p. 437, malignant growth (small-celled sarcoma) in the naso-pharynx involving the ear; p. 443, traumatism of the mastoid; p. 455, aural symptoms resulting from affections of the teeth; p. 468, exposition of the advantages of the dry treatment of otorrhœa; p. 496, aural polypi, with the following new classification: 1. Granulation tumors, usually of small size, dark color, soft consistence, bleeding freely, occurring where the suppurative process has been rapid and intense, and comprising about one-half the entire number of aural polypi; 2. Soft, or mucous papillomata, large, club-shaped, light color, elastic, do not bleed freely, surface generally lobulated, occurring where the irritation has been prolonged and not intense, and comprising about ninety per cent. of all aural polypi other than granulation tumors; 3. Fibromata, large, dense, pale colored, usually covered by a multiple layer of pavement epithelium, developed from the periosteal lining of the tympanic cavity (Schwartze), very rare; 4. Myxomata more rare than polypoid fibromata, not half a dozen instances having been satisfactorily described; pp. 544 to 555, on aural vertigo, are entirely new in this edition, and will repay careful reading.

In addition, it may be said that the author has entirely rejected the operation of tenotomy of the tensor tympani, that more stress is laid upon the treatment of the nares in chronic aural catarrh, and that in the treatment of otorrhœa he has abandoned the giving the syringe into the patient's hands, and much less frequently advises medicated instillations.

The second edition, as a whole, not only fully bears out the reputation achieved by the first edition, but adds to it, inasmuch as it gives

the more recent investigations in the field of otology enriched by the observations of so good an authority as the author.

That a text-book on a special subject in medicine should have reached its sixth edition in the space of eleven years is a gratifying illustration both of the value of the work as a means of instruction and of the advance of the specialty to which it is devoted. The sixth edition of DR. ROOSA'S Treatise on Diseases of the Ear contains more than one hundred and fifty additional pages, and more than thirty new illustrations. The general arrangement of the work is the same as that in the earlier editions, and is an admirable one both for the sequence of the various subjects and for ease in ready reference.

The sketch of the progress of otology, which forms the first chapter, has, of course, been extended to date; and the chapter on the methods of testing the hearing and on examination of the ear and throat is appropriately made to precede the chapter on anatomy of the external ear, as was not the case in previous editions. The woodcuts illustrating the manner of holding the aural speculum and mirror, and of introducing the Eustachian catheter, are new and a decided improvement on those which they have replaced, though it is a question whether anything less than a demonstration of these two performances can be of much instruction to the general practitioner; the text describing the manipulation of the catheter, however, is very clear, and affords the next best instruction to the demonstration mentioned.

The chapters on diseases of the external ear have been considerably extended by the addition of new material with eleven new illustrations. In speaking of furunculosis, the author quotes the communications of Löwenburg, but does not agree with that writer in regard to the ready communicability of furuncles. The article on foreign bodies in the ear has been enlarged, Green's and Buck's cases of detachment of the auricle for the removal of foreign bodies are quoted at length, and there is, in addition, a *résumé* of the observations of Noakes on ear cough. Both the chapters on anatomy of the middle ear and on injuries have been enlarged by the addition of much new and valuable material, as we should have a right to expect, since diseases of this portion of the auditory apparatus furnish by far the largest number of cases for observation.

To the chapter on acute aural catarrh, which contains, by the way, some excellent advice in regard to sea-bathing and on the treatmen' of the sometimes resultant condition, is added the subject of vascular tumors of the membrana tympani, and of diphtheritic inflammation of the middle ear.

In the chapter on chronic non-suppurative inflammation of the middle ear, more attention has been given advisedly to the differential diagnosis and to the peculiar symptom of hearing better in a noise; in regard to this latter, the author states that the opinion given in previous editions that boilermakers, for instance, hear better in a noise is strikingly incorrect, and from his more recent observations he draws the following conclusions:

1. There is a large class of people suffering from impairment of hearing in quiet places, who hear very acutely and with comfort in a great din or noise. 2. The disease causing the impairment of hearing thus relieved is situated in the middle ear. It is usually observed in the chronic non-suppurative form of disease of the middle ear, but it may also be found

in acute or subacute catarrh of this part as well as in chronic suppurative process with loss of the whole or a part of the membrana tympani. 3. The proximate cause of this phenomenon is not as yet positively known. It is probably to be found in some change in the action of the articulations of the ossicula auditus.

In regard to the results of treatment of chronic non-suppurative inflammation of the middle ear, the author's conclusions, based upon twenty years of observation, are worth quoting: 1. Chronic catarrhal inflammation in young subjects is susceptible of relief and cure in a large proportion of cases. 2. In adults it is susceptible of relief and alleviation in about twenty per cent. of the cases; of cure, in none. 3. Chronic proliferous inflammation remains as yet incurable, and is not susceptible of alleviation or relief, either in the young or old subject, in more than five per cent. of the cases.

The chapter on chronic suppurative inflammation of the middle ear, its complications and consequences, have been extended from ninety-eight pages to one hundred and twenty-eight pages, the increase being devoted principally to the questions of treatment, and to mastoid disease and its operative relief.

To the chapter on anatomy of the internal ear has been added an article on its physiology, and the subject of diseases of the internal ear, which occupied but twenty-nine pages in the third edition, has devoted to it seventy pages in the present volume. It is needless to say that it is very much more understandingly treated than in the edition of ten years ago, because it is in a better understanding of the internal ear and of its relations to the general economy that a large part of the advance of the last decade has been made. The various tests with the tuning-fork are very thoroughly given, but the author does not, in the opinion of the reviewer, attach sufficient value to the test with high musical tones. The articles on syphilis of the labyrinth, on cerebro-spinal meningitis, parotitis, and boilermakers' deafness, with their appended reports of cases, and the observations on the effects of quinine, are particularly interesting, and in regard to the use of electricity in the treatment of diseases of the internal ear and in diagnosis, to which space had been accorded in earlier editions, the author concludes that the value of this remedy has been greatly overestimated.

In conclusion, this book, with its seven hundred pages of clear type, embodying the results of long and acute observation and careful thought, can be most confidently recommended to the student and to the practitioner. C. J. B.

LES TRAVAUX DU LABORATOIRE DE PHYSIOLOGIE DE LA FACULTE DE MÉDECINE DE PARIS. Pub. par le docteur J. V. LABORDE. 8vo. pp. 223. Paris: Asselin et Houzeau, 1885.

MEMOIRS FROM THE PHYSIOLOGICAL LABORATORY OF THE PARIS FACULTY OF MEDICINE. Edited by DR. J. V. LABORDE.

THE memoirs of this volume are grouped under the title of physiology as that science was interpreted by writers of the schools of Haller and of John Hunter. The later writers would assign many of these essays

to the sciences of toxicology, pathology, and morphology. Dr. Laborde and his associates have embraced, under the head of physiology, subjects so remote one from the other as the functions of the gastric glands, the development of the heart, the action of alkaloids and of cinchona bark, and the anatomy and pathology of the human ear.

As is commonly the case in volumes of the kind, the themes are unequal in interest. Laborde, in operating on the semicircular canals, proposes dividing the operation of inducing artificial lesion into two stages; the first stage is devoted to the exposure of the canals, and the second (after an interval of twenty-four to forty-eight hours) to their division. The unilateral curvature of the head, which follows some of the sections, is attributed to the persistent contraction of muscles on the corresponding side of the neck.

Duval and Laborde, in experimenting on the sensory root of the fifth nerve as it lies in the medulla oblongata, conclude that the same lesions ensue as when the trunk of the nerve is divided. The bulbar sensory root is assumed to arise from the tubercle of Rolando, and the region itself to lie at the median side of the restiform body.

Gellé contributes three papers on the ear—namely, one on the anatomy of the tympanic membrane, one on the formation of bands of pathological character in the middle ear, and on the characters presented in an autopsy of the ears of an executed criminal. A. Lemoine narrates the results of recent studies on the localization of the brain. Accompanying his essay is a copious bibliography.

In the character of its illustrations, and in mechanical details, the volume is not equal to other contributions to literature of its class. The plates, while showy, are badly arranged and will not stand close scrutiny. Two entire forms are omitted from the table of contents,

Apart from the value of many of its essays, the book is interesting as an evidence of the drift of physiological work in France. This work is found to ally itself with the Italian methods rather than with the German or the English, and to be in close harmony with the thought of the earlier eras of physiology. H. A.

THE ESSENTIALS OF HISTOLOGY, DESCRIPTIVE AND PRACTICAL. FOR THE USE OF STUDENTS. By E. A. SCHÄFER, F.R.S., Jodrell Professor of Physiology in University College, London; Editor of the Histological Portion of Quain's Anatomy. 8vo. pp. 245. Philadelphia: Lea Brothers & Co., 1885.

THIS admirable work, the healthy outgrowth from the small duodecimo published by its author eight years ago, is a cheering example of well-won success, earned by the faithful and diligent pursuit of excellence in presentation of this essential foundation of all true medical science. Even a cursory examination of the author's former *Course of Practical Histology*, was sufficient to impress any medical man with a sense of its superiority as a text-book, and its constant employment for years as a guide to students engaged in the practical study of histology, has only served to strengthen our original conviction of its high intrinsic value as an aid to teachers of this important subject.

Prof. Schäfer informs us, in his preface, that the book was written with the object of supplying the student with directions for microscopical examination of the tissues, and the instructions he gives in their present improved form are so clear, precise, and practical, that little room for further improvement in these respects seems now to exist. At the same time that it is especially adapted for laboratory work, care has been taken to render it useful as an elementary text-book of histology, comprising all the essential facts of the science, but omitting unimportant details the discussion of which is only calculated to confuse the learner. For conveniently accompanying the work of a class of medical students, the volume is divided into forty-two lessons. Each of these will occupy a class from one to three hours, according to the extent of preparation expended beforehand upon the various tissues and organs by the teacher. A rule adopted by our author, to recommend only those methods upon which long experience has proved that full dependence can be placed, is faithfully carried out, and largely contributes to the satisfaction with which the work, in its former less developed form, has been used as a text-book, both in England and America.

Among the improvements which Prof. Schäfer has fortunately been able to effect, one of the most noticeable is the large number of additional figures which are inserted. One of the few faults that could justly be found with the *Course on Histology*, was the paucity of its illustrations, since it only contained at first about forty woodcuts; but this deficiency has been so fully remedied in the volume under consideration that two hundred and eighty-one, or more than seven times the original number, have been introduced. Nor are these, as is too often the case in works upon microscopy, mere diagrams or venerable figures duplicated and reduplicated upon successive pages in delusive repetition. With a few rare exceptions, all are worthy of careful and attentive study; valuable not only to the active practitioner who wishes to refresh his memory in regard to the actual appearance of tissue elements under the microscope, but also, and especially, to the student of histology, for whom they indicate the exact morphological characteristics which it is his privilege to bring clearly into view, under his own objective, in his most successful preparations.

Since this new work of Prof. Schäfer's will doubtless be speedily placed upon the list of text-books required in every progressive medical college, we feel that it needs no further recommendation at our hands.

J. G. R.

ANEURISMS OF THE AORTA, WITH ESPECIAL REFERENCE TO THEIR POSITION, DIRECTION, AND EFFECTS, BEING AN EXERCISE FOR AN ACT OF THE DEGREE OF M.B. IN THE UNIVERSITY OF CAMBRIDGE. By OSWALD BROWNE, M.A., M.B., of Trinity College, lately House Physician at St. Bartholomew's Hospital. Pp. 18, xv. London: H. K. Lewis, 1885.

WE have in this carefully prepared essay a study of 88 fatal cases of aneurism of the aorta occurring in St. Bartholomew's Hospital during seventeen years. Of these there occurred 31 aneurisms of the ascending

portion, 29 of the transverse, 10 of the third part, 8 of the thoracic aorta, and 9 of the abdominal aorta. 74 of the cases were in males.

Certain of the conclusions arrived at, though similar to those of other writers on the subject, are worth restating. Aneurisms of the first portion of the arch arise with great frequency immediately above the heart valves, from the right or dextro-anterior aspect of the artery, and take a direction to the right, presenting near the sternum in the third intercostal space. The pulmonary artery or superior cava are the structures most frequently compressed, and rupture, which occurs seldom, is into either pericardium or right pleura. Aneurisms of the second portion of the arch take either an upward direction and present beneath the first bone or the sternum, or in the first and second right intercostal spaces, or pass directly back, compressing the trachea. The left recurrent nerve it sometimes compressed, the vena innominata being seldom, the vena cava superior never, compressed; rupture occurs rarely, and is either into the left pleura, left bronchus, or the trachea.

Aneurisms of the third portion originate usually just below the orifice of the left subclavian and pass backward and to the left, lying to the left of the spinal column, commonly eroding more than one of the upper dorsal vertebræ; the œsophagus is more frequently subjected to pressure, and the termination is often by rupture into the left pleura or the œsophagus.

Sixty of the eighty-eight cases occurred in the ascending or transverse portions of the arch, and in only ten of these cases was there incompetence of the aortic valves. We would have been glad to see a statement concerning the size of the heart. Five tables give the details of the cases as affecting the various regions of the aorta. A short but interesting historical note precedes the substance of the paper. W. O.

MILK ANALYSIS AND INFANT FEEDING. A Practical Treatise on the Examination of Human and Cow's Milk, Cream, Condensed Milk, etc., and Directions as to the Diet of Young Infants. By ARTHUR V. MEIGS, M.D., Physician to the Pennsylvania and to the Children's Hospital. 12mo. pp. 102. Philadelphia: P. Blakiston, Son & Co., 1885.

THE author of this work has made the laudable attempt to found his views on infant feeding on a strictly scientific basis; in other words, on an accurate analysis of human milk, being convinced that all artificial foods must approach the composition of the infant's natural food to have a physiological recommendation for their use.

The author finds that as a result of his analysis of human milk, there is "never more than one per cent. of caseine." This statement is entirely at variance with all previous conclusions; and as everything is made to rest on it, must be subjected to rigid scrutiny before it can be accepted.

It is impossible, in discussing the subject, to avoid comparison with the results and methods of Prof. Albert Leeds. The investigations of the latter writer are among the most numerous, searching, and complete ever published on this continent, if they do not actually occupy the

very first position. Leeds urges the following objections against Meigs's method:

(1) That evaporation of milk over a water-bath, in order to obtain the *total solids*, is slow, and not entirely accurate. We do not believe that perfect drying can be thus effected, and the method is certainly tedious.

(2) The quantity of *fat* is too large by Meigs's method, inasmuch as the milk is not treated with absolute ether, but usually by a mixture of ether and water, which takes up other matters than fats (milk-sugar). This Leeds proves to be the case, and was the conclusion we had arrived at ourselves before reading Leeds's papers at all.

(3) The treatment to get *caseine* separated from sugar does not admit of entire accuracy by reason of errors inherent in "decantation," and owing to the fact that caseine is not wholly insoluble in boiling water. We think this objection is also well taken.

As a result of analyses by Meigs's methods, the proportions of fat and milk-sugar would be too high and those of the albuminoids too low. We are surprised that Meigs seems to ignore entirely the presence of other albuminoids than caseine in human milk. But we are still more surprised that he makes the scantiest reference to the German literature of this subject. It is a well-known fact that for years, in Germany, much valuable work has been done at the agricultural stations on this very matter of milk analysis. Even Hoppe-Seyler's *Handb. der Physiolog. Chem. Anal.*, in which the subject is treated in that writer's usual able style, is not once referred to, we believe.

Such being the case, it is not to be wondered at that Meigs should take such narrow ground in regard to the *reaction* of cow's milk. We hold still, that the statement of standard works, that the reaction of cow's milk is variable, being sometimes faintly alkaline, sometimes neutral, and sometimes acid, expresses the truth in the main—*i. e.*, for milk, as it comes fresh to us for use, and that is the practical question. Meigs's tests, made at *one* dairy farm, of milk freshly drawn from the animals on *one* occasion, do not settle the question, even as to perfectly new milk; we must know whether a change in feeding, etc., will not change the reaction: in fact, we do know that such is the case. The reaction is said to change also on standing.

We notice a similar kind of oversight in the author's method of collecting his samples of human milk.

If we are to draw accurate conclusions as to the composition of milk, we must know details regarding the specimens collected, as given in Leeds's tables, or better still, perhaps, use only average milk (as we do average urine) by taking the total quantity secreted for twenty-four hours.

As to Leeds's own method, which is the Gerber-Ritthausen one, we may say, in general, that it seems to meet the case better than any yet proposed, though we do not regard the method of separation of albuminoids as wholly satisfactory. With Meigs, we fear filters where caseine is concerned. But the other methods in the process seem to answer well; and even if there be slight loss of albuminoids by the Gerber-Ritthausen method, it will still appear that Meigs's estimate of one per cent. is altogether too low for caseine, for the Gerber-Ritthausen method gives as an average about two per cent. Meigs argues that because a mixture, such as he proposes as an infant food, is, "in its appearance, taste, and

reaction strikingly like human milk," there is therein a corroboration of his views. But Meigs, as well as Leeds, has shown that reliance cannot be placed on the appearance, etc., of milk to indicate its composition.

We believe in the "milk of human kindness," and that there is more of it now than among the ancients, but we do not subscribe to the logic of Dr. Meigs in his introduction; and if this chapter, and certain passages in the last one, had been omitted, it would have been better for a work aiming to be scientific. What of a statement like that on page 90? "It is well to give young infants nothing but their regular food, and not to give pieces of cake, or candy, or anything else of the kind, for the pleasure of seeing them enjoy it." Now for whom is this written, for the medical reader or the general public? For the former it is worse than superfluous. If for the latter, then we must unhesitatingly condemn the introduction of any such methods of lowering our scientific literature. It simply degrades an admirable book like this beyond all limit, and is something the profession must avoid, if it will remain true to its higher instincts.

Though it seems to us the methods and results given in this work will not all bear the closest scientific examination, we are glad that Dr. Meigs has essayed so difficult a subject. He has set a worthy example, and there is one golden page (71) in this little book, showing a moderation in spirit, and a conception of the scientific attitude, we could wish widely read and pondered upon in the medical profession. Dr. Meigs's book shows the great need for just such investigation as he has done; and the general indifference to the value of the collateral sciences; the widespread ignorance of chemistry, and its applications or possible applications to medicine, must be deplored by those who aspire to place the healing art on a truly scientific foundation. This book is written in a most lucid and agreeable style, and if it serves the purpose of bringing some third worker into the field to improve on all previous methods, a great end will have been served, and one in which, judging by the spirit of the book, the author of "Milk Analysis and Infant Feeding" will rejoice."

T. W. M.

THE INHALATION TREATMENT OF DISEASES OF THE ORGANS OF RESPIRATION, INCLUDING CONSUMPTION. By ARTHUR HILL HASSALL, M.D. Lond. 8vo. pp. 367. London: Longmans, Green and Co., 1885.

IF the author had accomplished nothing more than the positive demonstration by experiment of the fact that oral and oro-nasal inhalers, as hitherto constructed and used, almost wholly fail of their object, his book would be as welcome as the papers which he has from time to time contributed to the journals on this and similar subjects have been. But he has accomplished much more than this. He has given us in a convenient hand-book the results of much painstaking experimental research in the subject of medication by inhalation, including the chemistry and physics of the substances employed for this purpose, and the mechanism of the more practical of the apparatus used. In these respects his book is by far the most satisfactory of the few treating of the subject in the English language. It is also more comprehensive than the German

treatises, which, for the most part, as in the case of that of Waldenburg, are devoted to descriptions of the instruments and methods of the writer.

The results of carefully conducted experiments, the details of which are given with much exactness, show that four-fifths of the more important antiseptics, such as carbolic acid, creasote, and thymol, may be recovered, with the ordinary inhalers in use, from the sponge or receptacle after the inhalation is completed. The author's chamber inhaler, of which there are two forms, and a globe inhaler for the mouth and nose, and another for the mouth alone, are figured and described. These appliances are constructed with a view to obviating the defect of a too restricted surface of exposure for the medicament, shown to be present in all the instruments heretofore in use. The subject of inhalation chambers is discussed at much length, and one constructed by the author, at San Remo, is described in detail. Those portions of the volume devoted to the description of remedies of all kinds and of the whole range of disorders of the respiratory system, whether treated by the method of inhalation or not, are less satisfactory than those indicated by the title. Indeed, if we may be permitted to exercise the right of a critic, it will be to say that the fault of the book lies in its being too comprehensive.

The subject of the treatment of pulmonary disorders by inhalation is again attracting the scientific attention it deserves, but has not, of late years, received. Dr. Hassall's book is opportune, and will be read with gain and pleasure by all who are anxious to inform themselves as to the present state of knowledge in this field of practical medicine.

J. C. W.

A TEXT-BOOK OF PHYSIOLOGY. By M. FOSTER, M.A., M.D., F.R.S., Prælector in Physiology, Cambridge. Third American from the Fourth and Revised English Edition. By EDWARD T. REICHERT, M.D., Demonstrator of Experimental Physiology in the University of Pennsylvania. Royal 12mo. pp. 911. Philadelphia: Lea Brothers & Co., 1885.

THE appearance of another edition of this useful work, is a substantial guarantee of its excellence and practical value, to which the changes which have been recently made largely contribute. The higher and more recondite portions of the science are lightly touched upon, or altogether omitted, because less adapted to the capacities of medical students, for whom the work is especially intended. In his selection of subjects for cursory consideration, the author has shown himself eminently judicious, with the one exception of the department of embryology, to which, on account of its intimate association with all three of the great practical branches of medical science, and especially its aid in tracing the pedigrees of diseases, much larger space should have been allotted.

The "additions, corrections, and alterations," for which we are indebted to the able and industrious editor, are not so specificially designated as is customary; but if the brackets enclosing many portions of the book indicate Dr. Reichert's share of the work, the adjective valuable might well be conjoined with that of numerous, employed in the American preface to characterize his contributions. J. G. R.

QUARTERLY SUMMARY

OF THE

PROGRESS OF MEDICAL SCIENCE.

ANATOMY.

UNDER THE CHARGE OF

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The Anatomy and Morphology of some of the Constituents of the Skull in the Sphenoidal and Palatine Regions.

Mr. J. Bland Sutton (*Proceedings of the Zoölogical Society of London*, December 2, 1884, and June 2, 1885) raises weighty objections to the current views respecting the morphology of some of the constituents of the skull in the sphenoidal and palatine regions, and proposes important modifications based mainly upon the study of development. He regards the parasphenoid of osseous fishes and amphibia as corresponding to the vomer of mammals, the two agreeing in origin (ossification in membrane), position, form, and relations, while the bones, usually called vomer in fishes, are represented by portions, here termed *prepalatine*, of the superior maxillary bones of mammals.

In order to elucidate these homologies, the mode of ossification of the mammalian upper jaw has been specially investigated, and is described as proceeding from four centres, the extent of which is illustrated by figures of the bone in the human fœtus. The originally separate parts are:

(1) The *premaxilla:* the innermost part of this is of cartilaginous origin; being formed in the anterior extremity of the ethmo-vomerine plate. If anything interfere to prevent the premaxillary bone from meeting the ethmo-vomerine plate, the tip of this cartilage ossifies independently, and the double premaxillary bones described by Albrecht in cases of cleft palate and harelip are thus explained.

(2) The *prepalatine* portion, comprising the palate plate and a considerable portion of the inner wall of the antrum.

(3) The *maxillary* centre, including all the facial and orbital parts of the bone internal to the infraorbital canal.

(4) The *malar* piece, situated external to the infraorbital canal.

A new account is also given of the origin of the pterygoid element of the skull. In the human fœtus, at an early period, a cartilaginous bar is given

off from the upper end of Meckel's cartilage, subsequently the malleus, to near the extremity of the fronto-nasal cartilage. This represents the palato-quadrate arch of elasobranchs, amphibians, etc., and undergoes metamorphosis as follows:

(*a*) The anterior portion ossifies as the pterygoid bone, the internal pterygoid plate of human anatomy.

(*b*) The middle part remains throughout life as the cartilaginous portion of the Eustachian tube.

(*c*) The posterior extremity degenerates into fibrous tissue and becomes the anterior ligament of the malleus.

In studying the ossification of the sphenoid bone, Mr. Sutton has discovered that not only the pterygoid, as above mentioned, but also the portions of the body bearing the lingulæ sphenoidales are developed in cartilage. The number of centres observed by him agrees with that of the generally received accounts, but there is some difference in the dates of their appearance and junction, as will be seen by the following summary:

In the eighth week of fœtal life there appear in rapid succession centres for (1) the alisphenoids, (2) the basisphenoids, (3) the lingulæ, and (4) the pterygoids. At the beginning of the third month the nuclei of the orbitosphenoids appear, and later than these the presphenoidal centres, which, however, differ from all the foregoing in beginning on the surface of the cartilage beneath the perichondrium. In the course of the third month the basisphenoidal nuclei coalesce, and the lingulæ become united to the basisphenoid.

In the fourth month the orbitosphenoids join the presphenoids, and the pterygoids usually join the alisphenoids. In the seventh month the presphenoids and the postsphenoids coalesce, and in the eighth month the two presphenoidal centres fuse together.

During the first year after birth the alisphenoids with the pterygoids coalesce with the lingulæ around the Vidian canal, which is a passage left between these three elements, and the ossification of the sphenoidal turbinal commences.

From the fact that the lingulæ are developed in cartilage, the author concludes that they cannot, as supposed by Huxley and Parker, be the representatives of the basitemporals of birds, which are developed in membrane; and in support of this view he figures the base of the skull of a young ostrich in which a lingula sphenoidalis of cartilaginous origin is present on each side between the basisphenoid and alisphenoid, as well as the usual basitemporal bones. In the fowl, also, a separate centre is present for this portion of the body of the sphenoid. The lingulæ are the representatives of the sphenotic element of the fish's skull, and the basitemporals of the bird are identified with the bones usually termed pterygoids in the skull of the crocodile, for which the name *postpalatine* is proposed, while the so-called os transversum of the latter animal is the true pterygoid.

The Index of the Pelvic Brim as a Basis of Classification.

Prof. William Turner describes (*Journal of Anatomy and Physiology*, vol. xx., Part 1, October, 1885) the variations in the form of the pelvic brim in the different races of men, and proposes a classification similar to that in

use for the various forms of the cranium. The index is calculated in the usual manner, the transverse diameter being taken as the standard, and the proportion of the conjugate diameter to this giving the index according to the formula:

$$\frac{\text{Conjugate diameter of brim} \times 100}{\text{Transverse diameter of brim.}} = \text{index of brim.}$$

According to the form of the brim, as expressed by the index, the author divides pelves into three groups, which are thus defined:

Those in which the index is above 95 are termed *dolichopelvic*, those with an index below 90 are *platypelvic*, while those in which the index ranges from 90 to 95, both inclusive, are *mesatipelvic*.

The results obtained by Professor Turner from his own measurements, and from the published observations of previous writers, are summarized by him in the following table showing the distribution of the three pelvic forms amongst a considerable number of people or races. In all cases male specimens only are used for comparison, since the racial characters are more pronounced in that sex; the female pelvis showing a greater similarity of form in different races. A query indicates that the number of observations available is not sufficient to settle definitely the group in which the people should be placed.

Dolichopelvic.	Mesatipelvic.	Platypelvic.
Australians,	Negroes,	British,
Bushmen,	Tasmanians,	French,
Hottentots,	New Caledonians,	Germans,
Kaffirs,	Melanesians generally?	Europeans generally,
Andamanese,		Guanche?
New Zealanders?		Esquimaux?
Polynesians generally?		Laplanders?
Malays,		Chinese,
Ainos?		Mongolians generally,
		American Indians.

Some remarks are added on the form of the sacrum, and a sacral index is calculated by multiplying the breadth by 100 and dividing by the length. The examples given show that the proportions of the sacrum are related to the shape of the pelvic brim, and that both in the dolichopelvic character of the brim and in the relatively greater length of the sacrum, the Australians, Kaffirs, Bushmen, and Andamanese approach most closely of the races examined to the simian type, while the negroes occupy an intermediate position between these races and Europeans.

Sacral Index.

Kaffirs	92.8	Australians	98
Bushmen	94	Negroes	105.5
Adamanese	94	Europeans	112

This paper was communicated to the Anthropological Section of the British Association at the Aberdeen meeting in September, 1885, and forms a part of the author's memoir on the bones of the skeleton that will be published in the 'Challenger" Reports.

On the Extensor Proprius Indicis Digiti, and its Variations in Man and the Mammalia.

The most extensive and trustworthy series of statistics relating to human myology contained in anatomical literature are those which have been collected by Professor Gruber during his long period of active labor at the head of the Anatomical Institute of the Medical Academy of St. Petersburg, and which, from the number of subjects examined, and from the care with which the observations are made and recorded, may claim to be accepted as decisive of the normal condition and the frequency of occurrence of the commoner forms of variation in the several muscles examined. During the last few years Professor Gruber has made a special study of the musculature of the forearm, and his results concerning the extensor minimi digiti and the slip of the extensor carpi ulnaris, known as the ulnaris digiti quinti in man and mammals, have been published in Parts III. and V. of the *Beobachtungen aus der menschlichen und vergleichenden Anatomie.* In Part VI. he discusses in a similar manner the extensor indicis muscle, giving the results of his observations upon 600 subjects, or 1200 arms, dissected by himself, in the course of the years 1881–1884.

In all, 23 variants (1 normal and 22 abnormal forms) are recognized, 20 of which have at various times come under the notice of the author, the remaining 3 being known only from a single case of each recorded by other anatomists. In the 1200 limbs some form of variety was met with in nearly 22 per cent., the commonest being an accessory portion of the muscle going to the middle finger (extensor digiti indicis et medii), in 14 per cent.; and a splitting of the belly and tendon in nearly 3 per cent., or of the tendon only in 2 per cent. The rarer abnormalities of the muscle include a special sheath in the posterior annular ligament for the tendon in 7 arms, absence of the muscle in 6 cases (in one of these a short extensor indicis arising from the back of the carpus, and in another a short extensor indicis et medii from the lower end of the radius). An accessory head arising in the neighborhood of the back of the wrist in 4 arms, an extra slip passing to the thumb and index-finger (one form of extensor pollicis et indicis), a slip to the thumb (Gruber's extensor indicis et pollicis singularis), 2 extra slips, 1 passing to the thumb and 1 to the middle finger (extensor pollicis, indicis et medii), additional bellies to the middle and ring fingers (extensor digiti indicis, medii et annularis), or to the middle and little fingers (extensor digiti indicis, medii et auricularis), and lastly an extra belly to the ring finger alone (extensor indicis et annularis).

A supernumerary extensor indicis confined to the hand was seen in 13 cases; in 11 it arose from the base of the second metacarpal bone or exceptionally from the trapezium, and ended at the base of the first phalanx of the forefinger; in 2 it arose from the floor of the fourth compartment in the posterior annular ligament, and ended by joining the normal extensor tendon of the index. The various forms are fully and precisely described in the original, and figured in excellent plates.

The second section of the work is an exhaustive account of the comparative anatomy of the muscle in its various forms among mammalia; and it is shown that, apart from the mere splitting of the muscle and the rare varieties of which only a single specimen is recorded, nearly all the varieties that the

author has met with in man occur more or less constantly in different animals. Of the anthropoids, the gorilla has, as a rule, a simple extensor indicis proprius; the chimpanzee sometimes an extensor indicis proprius and sometimes an extensor indicis et medii; the orang usually an extensor indicis et medii; and hylobates most frequently an extensor indicis, medii et annularis, but sometimes a simple extensor indicis.

It is impossible here to follow the author through his review of the muscle in the other mammalian groups, but the following forms may be mentioned as corresponding to some of the varieties of the human muscle not represented among the anthropoids. Thus, an extensor pollicis et indicis united with the extensor indicis proprius, there being, however, no special long extensor of the pollex, is present in Felis domestica (compare Gruber, in *Virchow's Archiv*, lxxxvi. 483); and extensor indicis et pollicis singularis in Dasypus; an extensor pollicis, indicis et medii, but with absence of extensor secundi internodii pollicis, in Hapale, Solenodon, and Didelphis; while the short accessory extensor indicis or extensor indicis et medii has its homologue in the extensor brevis digitorum manus of many edentates—*e. g.*, Manis, Alyrunecophega, Bradypus, Cholœpus.

The Veins of the Spine.

C. Walter (*Recherches Anatomiques sur les Veines du Rachis;* thesis presented to the Faculty of Medicine of Paris, March, 1885) does not add much to the classical description of the veins of the spine by Breschet, so far as the dorsal and lumbar regions are concerned, but in the neck his researches supplement and correct the accounts generally given in anatomical text-books in several particulars. He describes the basivertebral veins, the anterior longitudinal spinal plexuses, the posterior spinal plexus, and the dorsal spinal veins in the usual way. The communicating branches between the anterior and posterior spinal veins form rings around the nerves where they enter the intervertebral foramina, and from each ring a thick plexus is continued outward surrounding the nerve as it traverses the foramen. A finer *perignanglionic plexus* is closely adherent to the fibrous sheath of the nerve, and into this the veins of the dura mater and the spinal cord empty themselves. Another ring is formed by the perispinal veins at the outer side of the foramen, and this constitutes the external limit of the main plexus.

In the cervical region the anterior and posterior longitudinal veins of the same side approach one another, and eventually unite in a large plexus situated in the lateral angle of the canal, occupying from one-fourth to one-third of its cavity, and being perforated by narrow openings through which the nerve roots pass. This plexus becomes more expanded opposite the atlas, and the author gives the name of *occipito-vertebral confluence* to the dense venous mass surrounding the dura mater in the neighborhood of that bone. From the confluence the perispinal venous trunks of the neck mainly take their origin, by means of a large prolongation accompanying the vertebral artery above the atlas and a smaller one below. Some smaller veins ascend from the confluence and partly enter the anterior condylar foramen, partly join the circular plexus at the margin of the foramen magnum and its continuation over the basilar process.

The perispinal veins in the neck form three main trunks, the *posterior jugular* (deep cervical of English text-books), *internal vertebral*, and *external vertebral* veins.

The posterior jugular vein is formed by the union of the following roots: (1) the mastoid vein, (2) the posterior condylar vein, (3) one or two deep occipital veins, (4) branches from the occipital foramen, (5) the large branches from the occipito-vertebral confluence, (6) branches of communication with the vertebral veins. It generally has also a direct anastomosis with the beginning of the internal jugular vein. The trunk is connected with the one of the opposite side by a cross branch behind the spine of the axis, and then descends to pass forward below the transverse process of the seventh cervical vertebra and join the termination of the vertebral vein.

The internal vertebral veins are always multiple, forming a plexus which fills up the vertebro-arterial canal. In each intertransverse space this plexus becomes divided into an anterior portion which surrounds the artery, and a posterior separated from the foregoing by the issuing cervical nerve. Inferiorly, these veins unite into a trunk which leaves the canal usually below the transverse process of the fifth cervical vertebra, and after being joined by the posterior jugular vein terminates in the well-known manner. The internal vertebral veins are derived mainly from the occipito-vertebral confluence. They receive, as they descend in the neck, (1) all the veins of the anterior surface of the cervical spine, which form a considerable plexus, especially in front of the second or third vertebræ; (2) the dorsal spinal veins of the neck; (3) branches of anastomosis with the posterior jugular; and (4) branches of anastomosis with the intraspinal veins, through the plexus of the intervertebral foramina.

The external vertebral vein is a vessel that begins between the atlas and axis by offsets from the internal vertebral veins and the occipito-vertebral confluence, and descends over the articular processes to join the posterior jugular vein at the level of the fourth or fifth vertebra.

There are very numerous and free communications between all these veins, and they present many variations in the details of their arrangement. The external vertebral vein is often wanting, being replaced by a number of irregular branches passing from the internal vertebral to the posterior jugular vein.

A general view of the veins of the back of the neck shows that they are disposed (as has been pointed out by Foucher) in four considerable plexuses beyond the scanty subcutaneous network, viz.: (1) between the trapezius and splenius, the branches of exit passing to the occipital and external jugular veins; (2) between the splenius and complexus, emptying itself into the transverse cervical vein; (3) between the complexus and transverso-spinalis, having the posterior jugular vein for its afferent trunk; and (4) the dorsal spinal between the transverso-spinalis and the arches of the vertebræ, opening into the internal vertebral veins. Many cross branches pass through the muscles and connect the different layers. The author states, however, that he has not yet been able to confirm all the details of Foucher's description.

The typical disposition of the spinal veins is represented in six diagrammatic figures.

PHYSIOLOGY.

UNDER THE CHARGE OF

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Coagulation of the Blood.

C. Holzmann gives a critical review of the literature on this subject, and the details of some experiments of his own performed in the pharmacological laboratory of Prof. Dogiel, of Kasan, from which he obtains results, on the whole, confirmatory of the views of Hammarsten, viz., that coagulation is essentially a fermentive process, the fibrinogen undergoing a change which results in the separation of an insoluble substance, rich in oxygen—fibrin—from another kind of albumen, poor in oxygen, which remains in solution but in less quantity. The following are his conclusions:

(1) A certain globulin can be prepared from horse's blood identical with fibrinogen. It does not coagulate at ordinary room-temperature or on the addition of distilled water.

(2) Typical coagulation may be produced in this solution of fibrinogen by treatment with any of the following: Defibrinated blood; blood serum; watery extract of the alcoholic precipitate of the albumens of blood serum or egg albumen; products of decomposition of boiled egg albumen; the passage of a prolonged current of oxygen.

(3) Fibrin ferment is not peculiar to the blood, but occurs also among the products of decomposition of albumen.

(4) That fibrin is the result of a process of oxidation occurring in the fibrinogen is supported by the facts; and typical coagulation follows the passage of a current of oxygen through the solution of fibrinogen; that coagulation is ordinarily a fermentive action; and in the coagulation of the blood the fermentation and the oxidation cannot be separated one from the other.

(5) When a dog is bled to death, the last blood that flows coagulates more quickly than the first, though there is no appreciable increase in the amount of fibrin formed.

(6) The well-known fact that venous blood coagulates less quickly than arterial.—*Archiv für Anatomie und Physiologie*, July 20, 1885, p. 210.

Bronchial Movements.

Prof. Roy and Dr. Graham Brown made a preliminary communication to the Physiological Society (*Journal of Physiology*, July, 1885) of an investigation on the above subject, which still was occupying their attention.

They introduced into the bronchus a sound made of a bent glass tube, at the distal extremity of which was a bag of animal membrane distended with air, so as to occlude the air-passage in which it lay. The proximal end of the glass tube was in connection with a special recording apparatus. Any change in the capacity of the branches of the occluded bronchus was thus graphically recorded.

Stimulation of the uncut vagus caused contraction of the bronchi, if the other nerve be intact, but dilatation if the nerve of the other side be previously cut. Section of one vagus caused dilatation of the bronchi of the lung of that side. Stimulation of the peripheral end of the cut vagus caused contraction more marked than when both nerves are intact. Stimulation of the central end of the cut nerve sometimes caused contraction, but in a much less marked degree than the other end, while in other cases "powerful expansion" followed. Cessation of the artificial respiration causes expansion of the bronchi while the vagi are intact, but has no effect when the nerves are cut. Both atropine and nicotine seem to paralyze the effect of the vagus on muscles of the bronchi. They conclude that the vagi are the only means of communication between the cerebro-spinal centres and the bronchial muscles, and that these nerves carry impulses both to and from the bronchi, tending either to contract or expand the tubes. They give no explanation of the probable uses of this motor mechanism of the bronchial tubes.

The Heart's First Sound.

Having failed to find cessation of the heart's first sound on clamping the veins, or its immediate reappearance in its fullest intensity when the vessels were set free, Yeo and Barrett examined with a flexible binaural stethoscope the ventricles of a cat and two dogs after having removed them from the animals. In each case the empty ventricle gave a distinct sound. In the dogs the sound could be heard after the auricles were severed from the ventricles, and they conclude that "a definite and characteristic tone, similar in quality to the first sound, is produced by the heart muscle under circumstances that render it impossible for any tension of the valves to contribute to its production." This fact was demonstrated at the meeting of the Physiological Society on 9th of May.—*Journal of Physiology*, July, 1885.

In the same number of this Journal (p. 287) Herroun and Yeo call attention to the inadequacy of the proofs that the so-called muscle tone of skeletal muscles depends on a number of successive, fused contractions like artificial tetanus, and to the fact that any regular vibrations which are too slow—*i. e.*, too deep in tone—to be heard as a musical note, give the sensation of a tone identical with the proper resonant tone of the membrana tympani (Helmholtz). They then examined with a flexible binaural stethoscope both human and cat's muscles, and found that with the slowest rates of stimulation the quality of tone could be heard. They conclude:

(1) That a single contraction of a skeletal or heart muscle gives rise to motions or vibrations which evoke the resonant tone of the membrana tympani in the same manner as the tetanic or voluntary contraction.

(2) That the tone heard in voluntary contraction is no evidence of distinct or regular vibrations in the muscle, but merely of motions, regular or irregular, which produce the vibration of the membrana tympani.

(3) That the tone heard in voluntary contraction is, therefore, no evidence of regular discontinuity of natural nerve impulses, but simply depends upon trembling movements due to variations, either of force or distribution of stimulation.

(4) That the objection to the first heart sound's being a muscular sound

because the systole of the heart is a single contraction is not valid, since the single contraction of a muscle causes motions or vibrations which call forth the resonant tone of the ear.

The Depressor Nerve.

In studying the action of this nerve and the effect of variations of blood pressure on the heart, considered as a sensory organ, Professor Sewall (Michigan) and Dr. Steiner came to the conclusion that the depressor nerve has other important functions beside the well-known one established by the classic work of Ludwig and Cyon, viz., of conveying from the heart to the vasomotor centre impulses which inhibit that centre, and by allowing the visceral vessels of the abdomen to expand, produce a depression in the general blood pressure, and thus relieve intracardiac tension.

They found that when the carotid arteries are clamped the rise in blood pressure, though greater than that which follows clamping of other large arteries not supplying the brain, was inconsiderable when compared with the rise that followed the same operation after previous section of the depressor nerves, in which case the pressure was observed to rise 30 per cent. to 75 per cent. above the normal. This is explained by supposing the depressor nerves while intact to be able, by their reflex inhibitory influence on the abdominal vascular area, to counteract almost completely the tendency to high pressure, which follows the stimulation of the vasoconstrictor centre in the medulla, by the local deprivation of blood consequent upon the clamping of the carotid. Section of the vagus or sympathetic trunks gave negative or uncertain results.

Varying the intracardiac pressure by compressing the vena cava inferior with and without previous section of the depressor nerve, they found that increased pressure in the heart was followed by a slowing of the rhythm when the depressor was intact, but not when it was divided. From this they conclude "that high arterial blood pressure, which in this case means correspondingly low venous pressure, stimulates the endings of the depressor nerves and brings about reflex by a slowing of the pulse-rate, even though the cardio-accelerator apparatus may be simultaneously excited."—*Journal of Physiology*, July, 1885.

Glycogen.

In a lengthy dissertation (*Archiv für Microscop. Anat.*, Aug. 17, 1885, pp. 259–404), chiefly historical and critical in character, Dr. Dietrich Barfurth gives the details of the exact amount of work—mostly confirming the results of others—which was executed in the Anatomical Laboratory at Bonn. He depends on the histochemical examination of the tissues by a special method for the determination of the amount of glycogen they contain. Small pieces of the tissues to be examined are placed in absolute alcohol immediately after their removal from the dying animal. The section made from the tissues thus hardened are stained with (1) a solution of iodine in potassic iodide, (2) iodine glycerine, or (3) iodine gum (Ehrlich). Thus treated, the glycogen of muscle turns violet, that of the liver mahogany-brown. By controlling the results thus obtained by other methods of determining the presence of glycogen, he was satisfied that the absence of the characteristic color shows with absolute certainty the absence of glycogen.

He examined a great variety of animals, and in all found glycogen widely distributed throughout the tissues, being in all active protoplasmic cells, but not in the nuclei. The fact that glycogen is a normal product of the chemical changes going on in all cells is insisted upon, and a share in its production given to all tissues, though the liver is admitted to have the most important part to play in this action, because it has the best opportunity of nutritive excess.

Trypsin Formation.

Dr. S. Lewaschew, working under Heidenhain's direction, performed a series of experiments with the object of testing whether zymogen is the usual precursor of trypsin (Heidenhain), or whether finding zymogen is the exception, and whether trypsin is commonly present in the living cells of the pancreas, as stated by Weiss. He insists on the necessity of using glycerine free from water, and as great dispatch as possible in making the extract of the gland. In the first series of 38 dogs not specially fed for the experiment, 2 gave active extracts both when made immediately after death and after 24 hours, indicating the presence of trypsin in the fresh pancreas; in 27 cases the extracts of the fresh gland contained no trypsin, though the later extract contained a considerable quantity; and in 9 cases neither the fresh extract nor the gland kept for 24 hours was effective in digesting fibrin. In the second series of experiments the pancreas was excited to activity by food (9 cases) or the injection of pilocarpin into the blood, which produced intense action of the gland (14 cases). In every instance, the extract of the fresh gland was free from trypsin. In the third series the opposite condition was examined, the gland being rested by abstinence from food for various periods (20–120 hours). In these 14 animals no trypsin existed in the fresh extract. After the shorter periods of starvation, the extract made 24 hours after death was very rich in trypsin, but after the longer periods (120 hours' starvation) no trypsin was to be detected, although the granules generally believed to be associated with its presence were present in great quantities in all parts of the cells. These cannot then be the material for the formation of the ferment. The granules and ferment probably appear and disappear together under normal conditions, but in prolonged periods of inanition the granules which are the visible carriers of the ferment persist after the latter has disappeared.—*Archiv für die gesammte Physiologie des Menschen und der Thiere* (*Pflüger*), Sept. 10, 1885.

Cerebral Cortex of Newborn Animals.

Dr. Josef Pareth attempts to decide the question whether the central cortex only becomes capable of excitation ten days after birth (Soltmann); or was excitable at or even before birth (Tarchanoff). In the case of dogs, varying in age from eighteen to forty-eight hours, he got only one negative result from the animals employed, and concludes that even in the first days of extrauterine life the cerebral cortex of dogs is capable of excitation. The experiments giving an opposite result, he thinks, were vitiated by the use of anæsthetics, which have so powerful an influence on animals at this time of life.—*Arch. f. d. gesam. Physiologie*, Oct. 13, 1885.

MATERIA MEDICA, THERAPEUTICS, AND PHARMACOLOGY.

UNDER THE CHARGE OF

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Physiological Action of American Aconites.

Several agents of considerable promise, belonging to our indigenous materia medica, have been investigated during the last quarter and previously, in the laboratory of experimental therapeutics of the Jefferson Medical College of Philadelphia.

Under this title there appears in the last issue of Prof. Lloyd's *Drugs and Medicines of North America*, a preliminary note of investigations made by Dr. Bartholow into the actions of Aconitum Fischeri and A. uncinatum. As the latter proved to be inert, further reference to it is unnecessary. The former, however, was ascertained to be a very interesting substance. The experiments were made on cold- and warm-blooded animals (frogs and rabbits), and the preparation used was a concentrated fluid extract prepared by Prof. J. U. Lloyd.

The rate at which it moved to affect function was more rapid in warm- than in cold-blooded animals, but the results of the actions were the same.

On the mucous membrane of the mouth Aconitum Fischeri acted as A. napellus, causing the characteristic numbness and tingling, which, as Squibb has elaborately shown (*The Ephemeris*, August, 1885), is quite distinctive of A. napellus. An experiment made by Dr. Bartholow yielded these results:

"To determine the effect of the Aconitum Fischeri on the mucous membrane, I placed a large drop near the extremity of my tongue. In a minute the tingling which is so characteristic a symptom of Aconitum napellus was perceived, and it then rapidly increased, but did not attain its maximum for an hour. I then tested the state of the sensibility of the tongue at this point with the æsthesiometer, and found that the perception of the two points was as acute as at the unaffected parts of the mucous membrane. The pain-sense was as little affected as the tactile sense. Pricking with the point of the æsthesiometer caused as acute a sense of pain in the area occupied by the tingling as elsewhere. At the end of two hours the tingling was hardly abated in any degree."

The following are the conclusions reached by the physiological investigation:

"Aconitum Fischeri is a paralyzer of motility, but it does not impair the contractility of muscles, or the irritability of the motor nerves. Its action is central, not peripheral.

"It does not affect sensibility or the reflexes until all manifestations of motor activity cease.

"It does not paralyze the heart, but by removing the inhibition permits a more active movement of the organ. It paralyzes most completely the vagus, so that the strongest stimulation causes no response.

"Death ensues by paralysis of the respiration, the heart continuing in action for some time after respiration has ceased."

Comparing the actions of Aconitum Fischeri and A. napellus, Dr. Bartholow concludes that

"Notwithstanding the botanical affinities, and, in some respects, the physiological, there are marked and fundamental differences between them.

"Aconitum napellus affects sensibility, and lowers the irritability of the sensory nerves. Aconitum Fischeri does not destroy the tactile or pain-sense, although it causes the characteristic tingling, and it does not affect the irritability—the power to perceive and transmit peripheral impressions—of the sensory nerves.

"Aconitum napellus paralyzes the end-organs of the motor nerves, the trunks, and ultimately the motor portion of the cord. Aconitum Fischeri does not affect the contractility of muscles, or the irritability of the motor nerves, but paralyzes the motor centres of the cord.

"Both cause death by paralysis of respiration.

"They affect the heart in opposite modes: Aconitum napellus stimulates the vagus roots, and slows the heart, while Aconitum Fischeri paralyzes the vagus and increases the force and number of the cardiac pulsations. Aconitum napellus, after a brief stimulating action, paralyzes the vasomotor centre in the medulla, and greatly lessens the blood pressure. Aconitum Fischeri rather stimulates the vasomotor centre, and does not lower the blood pressure."

An antagonism of actions between Aconitum Fischeri and strychnine was, also, ascertained to exist, but the extent of this remains to be determined by further experiments.

The therapeutical powers of the American aconite can be readily deduced from its physiological actions. Cases in which spasm is a predominant feature, especially of the respiratory system, and in cardiac affections characterized by exaltation of the inhibition, are those most likely to be benefited by Aconitum Fischeri.

Grindelia Robusta: Experiments to Ascertain its Physiological Action.

Dr. John A. Buffington, in a thesis for the Doctorate which received the "Lea Prize," relates an elaborate investigation made in the laboratory of experimental therapeutics of the Jefferson Medical College, under the supervision of Dr. A. P. Brubaker, Demonstrator. We give a summary of the conclusions arrived at by Dr. Buffington:

Grindelia was found to be not actively toxic. The lethal dose of the fluid extract, the preparation used in the experiments, was ʒij–ʒiij for rabbits weighing twenty-eight ounces to thirty-two ounces; and ɱlx–ɱlxv for frogs weighing one ounce; and the time required to cause death was one to three hours in the former, and a half to one hour in the latter.

Grindelia first lessens, then destroys sensibility, the action beginning in the peripheral—the end-organs—then involving the trunk of the nerves, and ultimately the spinal cord. Motility is affected in the same order, the paralysis beginning in the nerve terminals, then involving the nerve-trunks, and finally the motor centres in the spinal cord.

The heart is slowed, because of an increase of inhibition due to stimulation

of the cardiac inhibiting centre, and the blood pressure is raised, chiefly by stimulation of the vasomotor centre in the medulla. The respiration is increased in frequency by an action of the agent on the respiratory centre, and, also, on the terminals of the pneumogastric in the lungs. Toward the end, the respiration becomes slower, and is jerky in character, and death ensues by arrest of respiration, the heart continuing in action some time longer.

The cerebral effects of grindelia are quite pronounced. A condition of narcosis, more or less profound, ensues, as the effects of the drug develop. This action appears to be due to a direct impression made on the cells of the cerebral lobes.

A marked increase of the urinary secretion was noted in all the animals experimented on. As some constituents of the drug appear in the urine [the resin?] a direct action on the renal structures may be admitted. The increase in the blood pressure is another factor—and, it may be, the chief one.

This investigation throws light on the nature of the curative effects exerted by grindelia in asthma, for the relief of which, hitherto, it has been chiefly used. The cerebral, the cardiac, and the renal actions, however, suggest its use in other maladies.

Fluid Extract of Camellia (C. thea) and Hydrobromate of Hyoscine.

These preparations have been made the subject of physiological and clinical investigations by Dr. Judson B. Andrews, Superintendent of the State Asylum for the Insane, Buffalo, N. Y. (*American Journal of Insanity*, October, 1885).

The preparation of camellia employed by Dr. Andrews in these investigations, was the fluid extract of Squibb. The active principle was *caffeine*. The volatile oil which it contains may contribute in some slight degree to the results. The physiological study consisted in ascertaining the effects on the heart and circulation of man, the sphygmograph being used to demonstrate the character of the action. Although very limited in scope, the experiments are not without value, confirming, as they do, the previous observations on the action of caffeine. According to Squibb (*The Ephemeris*, 1885), each fluid-drachm of camellia extract yields 1.72 grains of caffeine. The doses administered by Dr. Andrews ranged from ʒj to ʒiij; the first experiments were *in propria persona*, and subsequently various subjects affected with cardiac lesions were submitted to experiment. The results corresponded to those heretofore obtained from caffeine, but Dr. Andrews finds that "two grains of caffeine in tea in its natural condition are equivalent to three grains of caffeine extracted from the tea and used as caffeine." If this be confirmed, the fluid extract of camellia will prove more efficient, relatively, than caffeine; and, as it is more convenient and cheaper, will come to be preferred for medicinal use.

The effects of camellia were quite uniform. It reduced the pulse 10 to 24 pulsations per minute, increased its force and volume, and raised the arterial tension. The effects began in a half hour to an hour after its administration, were maintained at the maximum about an hour, and then began to decline, the normal being restored in about three hours.

Hyoscine.—Dr. Andrews made a series of observations on himself, on an attendant in the hospital, and on several patients, with the *hydrobromate of*

hyoscine, a secondary product of hyoscyamine. As in the experiments with camellia, the sphygmograph was used to record the impressions made on the pulse. In doses ranging from $\frac{1}{200}$th to $\frac{1}{133}$d grain, it was found to lessen the pulse 10 to 24 beats per minute; and, if we may depend on the accuracy of the sphygmographic tracings, to lower the arterial tension. It proved to be decidedly hypnotic in its action, and it produced no unpleasant after-effects—no headache, nausea, or other disturbance, except an unpleasant dryness of the fauces and disordered vision.

Therapeutically studied, Dr. Andrews came to the following conclusions:

"We report in all 22 cases in which hyoscine has been employed. Of these, 11 are of melancholia, 6 of acute mania, 1 of chronic and 1 of paroxysmal mania, 1 of mania with epilepsy, 1 of dementia, and 1 of acute chorea."

"The limits of the doses were from the $\frac{1}{200}$th to $\frac{1}{133}$d of a grain, in all of which I found it a perfectly safe remedy. It was given by the mouth in twenty of the cases, and in two by hypodermatic injection. . . The physiological effect of the drug was experienced in from fifteen minutes to two hours, but the average time was less than an hour. The pupils were dilated in most of the cases, but the disturbance of vision and the dryness of the fauces, or the inhibition of muscular movements, were only complained of in two cases mentioned, but in many of them there was such a degree of mental disturbance that the absence of complaint is of little value in arriving at a knowledge of the existence of those unpleasant effects. There was no nausea, and in the few cases in which it was given sufficiently long to produce the results, there was no disturbance of the appetite with the consequent loss of flesh, as is sometimes experienced in the continued use of hyoscyamia. There is also less disturbance of the vasomotor system than is found in the use of that alkaloid. It would seem from the experiments that it is a powerful sedative to both the cerebral and spinal systems, and from the success attending its use, and for the reasons stated above, it would seem justly entitled to a high position in the list of hypnotic remedies, and will, I think, surpass in favor the sister alkaloid of hyoscyamus."

Therapeutic use of Cocaine.

The interest aroused by the discovery of the local anæsthesia induced by cocaine is but little abated, and communications on the subject continue to appear.

The effects of cocaine in the treatment of neuralgia, when injected in the neighborhood of the painful nerve, have not been universally admitted, but the evidence that its local action is effective is accumulating. In illustration of this point we quote a recent experience of Dr. Max Schneider (*Centralblatt für die gesammte Therapie*, August, 1885, p. 363). A patient had had three attacks of neuralgia of the fifth, each one increasing in severity. The first seizure was cured by quinine; the second, after six months of persistent treatment, was finally arrested by morphine and iron; and the third, treated by localized injections of salicylate of cocaine, was relieved at once, and after eight injections on the sixth day there was no longer any pain—only some tenderness to pressure at the point of exit of the nerve, which was removed by three applications of galvanism. The first dose administered

was four decigrammes, equivalent to about six grains, and this gave complete relief, substituting a sense of comfort for the pain before experienced.

Toxic Symptoms from the Use of Cocaine.

The use of cocaine is not without ill results, and there is increasing evidence that unpleasant accidents sometimes occur. The writer has observed headache, vertigo, and faintness, after the local use of even small doses.

In a recent issue of the *Lancet* (Nov. 7, 1885) there is an editorial note calling attention to toxic symptoms observed by Knapp, Mayerhausen, of Freiburg, Reich, Bellyarminoff, of St. Petersburg, and others. In the case narrated by Mayerhausen, an abstract of which we find in the October issue of *Centralblatt für die gesammte Therapie*, p. 457, less than one per cent.—so diluted was the solution by a copious secretion of tears—caused, when instilled into the conjunctiva, headache, nausea, constriction of the throat, weakness of the tongue, impaired speech, and other severe symptoms, lasting twenty-four hours.

Dr. Spear, Medical Inspector U. S. Navy (*The Medical Record*, Nov. 15, 1885), reports a case of cocaine poisoning, in which the symptoms simulated opium narcosis. There were the characteristic coma and insensibility, contracted pupils, feeble pulse, cyanosis, and cold perspiration. The amount taken was ten grains, but the patient had swallowed an unknown quantity of whiskey. Injections of atropine, strong coffee, flagellation, and walking, were the measures resorted to under the impression that the condition was due to opium.

Hypnotics.

In a series of lectures entitled "Conferences de Thérapeutiques," Dujardin-Beaumetz has taken up various therapeutical subjects. In a recent lecture, which appears in the *Bulletin Générale de Thérapeutique*, for Oct. 30, 1885, he discourses on the "new hypnotics." We transcribe some of his observations.

Chloral appears to act on the heart, and, as has been affirmed by Gubler, it is a heart poison in large doses. In all febrile diseases of a congestive form, chloral is far superior to opium for the production of sleep; as in typhoid, pneumonia, and alcoholic delirium. On the contrary, this remedy is contra-indicated in cardiac affections, especially in troubles of the aortic orifice; here opium is much better. Chloral is a most useful remedy in certain forms of intoxication, especially in poisoning by strychnine, in delirium tremens, and uræmic convulsions, but in these it is still inferior to *paraldehyde*.

The sleep caused by paraldehyde is analogous to that produced by chloral. It is usually calm, but in some instances the sleep is preceded by excitement. The assertion of Quinquad and Hénocque that it acts on the hæmoglobin, producing methemoglobin, has been disproved by Hayem, who has shown that it does not affect the coloring matter of the blood. It is eliminated almost entirely by the lungs, but when large doses are given some portion escapes in the sweat.

One of the most interesting facts regarding the action of paraldehyde, is its antagonism to strychnine, which was first demonstrated by the Italian physi-

cians, and since confirmed by Coudray. Dr. Dujardin-Beaumetz relates some experiments of his own proving this antagonism. Ether, chloral, chloroform, have similar powers in this respect. They all act, as does paraldehyde, on the cells of the nervous matter. We know that strychnine, also, stimulates the cells of the cerebro-spinal axis. It consequently happens that when the nerve elements are acted on by one agent, they will not receive an impression from another, and thus in a strictly physiological and scientific manner can be explained the antagonisms of these several remedies and strychnine.

Compared with chloral, paraldehyde has these advantages:

It is less irritant, and better supported by the stomach. It is not a heart poison. It is a more efficient antidote to strychnine. But it has less analgesic action, and less power to relieve pain than chloral, and hence when insomnia is caused by pain the latter is preferable, and morphine is still more efficient. In nervous insomnia, in that due to the abuse of alcoholic drinks, paraldehyde is much superior to chloral. Especially is paraldehyde most useful in the different forms of mental disorder, as Drs. Kéraval and Nerkam have shown by numerous trials. They have also shown that it is a valuable hypnotic in certain cases of insomnia with the excitement occurring in the course of some cerebral affections, in the convulsive neuroses, and especially in epileptic crises, and in the multiform manifestations of hysteria. Dr. Dujardin-Beaumetz has also treated many cases of morphiomania by paraldehyde, giving three or four grammes a day (forty-five to sixty minims). It does not appear to lose its effects by repetition, since the same results have been obtained through months of treatment.

Mr. G. F. Hodgson, an English surgeon, has had experiences with paraldehyde which supplement the observations of Dujardin-Beaumetz (*The British Medical Journal*, July, 1885). His report is based on the experience gained from the use of about two quarts of the agent in a variety of cases. Mr. Hodgson finds it to be a hypnotic of great value, in that it produces sleep like the natural state, promptly, and without any unpleasant after-effects. He regards it as the most appropriate hypnotic in the insomnia of gout, in mania, hypochondriasis, delirium tremens, migraine, and in the wakefulness of ordinary diseases. His prescription is as follows:

℞.—Paraldehyde	ʒj.
Spiriti chloroformi	♏xv.
Pulv. tragacanth. comp.	ʒj.
Syrp. aurantii	ʒiv.
Aquam	ad. ʒiij.—M.

This dose is sufficient in the milder cases, but must be repeated in the more severe.

Menthol as a Substitute for Cocaine.

The Japannese for two hundred years have used *menthol* as a local anæsthetic. They obtained it from the essence of mint, by refrigeration, menthol crystallizing out. Michigan mint, it is said, furnishes a notable quantity of menthol, and to this it is proposed to give the name of *pipmenthol*.

Recently Dr. Rosenberg, of Berlin, has sought to substitute menthol for cocaine. Having observed that a solution of cocaine, applied to the tongue,

caused a sensation of coldness, it occurred to him that probably some other substances having this effect might similarly lessen sensibility. With this view he applied a compress of ether to the swollen mucous membrane of the nares. The patient experienced a severe burning sensation at the point of application, but immediately he breathed more easily, the swelling of the inferior turbinated bones lessened, and the sensibility of the part was reduced. This effect lasted about a quarter of an hour. By this procedure, he caused in two cases the reflex phenomena to disappear—in one, a suborbital neuralgia; in both, very pronounced oppression of breathing.

Seeing that the cold produced by the ether did not sufficiently lessen sensibility, and recalling that the menthol crayon applied to the skin in a case of migraine caused a vivid sensation of cold, he associated the two agents, and used a solution of twenty grammes of menthol in one hundred grammes of ether. The result was more favorable. Immediately after the application of the ethereal solution of menthol, the mucous membrane becomes pale, as is the case with cocaine, after which the swelling of the turbinated bones diminishes, and the sensibility disappears.

In seventy observations, Dr. Rosenberg saw neither inflammation nor cauterization of the mucosa. To ascertain whether the anæsthesia produced by the ethereal solution of menthol corresponded to that due to cocaine, he applied to the same individuals a five per cent. solution of the latter, and he found that the sensations of the patient were the same, and the effects were alike in both cases.

The action of the menthol lasts about a quarter of an hour to half an hour, sometimes for an hour and a half. By repeated applications the anæsthesia may be kept up for two or three hours.

Rosenberg also employed alcoholic and oleaginous solutions of menthol, from 20 to 50 per cent., for the relief of pain. These concentrated solutions sometimes caused a sensation of heat, followed, however, by an agreeable coolness. An ethereal solution of menthol of 20 per cent., he ascertained, also induced anæsthesia of the mucosa and tumefaction of the erectile tissue, and the same diminution of sensibility followed applications to the fauces, but complete anæsthesia, lasting from one to three minutes, resulted when the stronger solutions were applied. This strength of application was found useful when laryngoscopic examinations and cauterizations were to be made. For application to the larynx itself, Rosenberg found a 10 per cent. solution strong enough, since when this strength was exceeded cough was produced.

Dr. Baratoux (*Le Progrès Médicale*, 1885, p. 199), repeating the methods of Rosenberg, arrived at results somewhat different. After some trials with alcoholic and ethereal solutions, on the recommendation of M. Houdé, pharmacist, he resorted to petrobasaline as the solvent, for this was found to be less irritating than ether and alcohol. This solution applied to the skin caused, in a few minutes, a sensation of coolness, and on the tongue smarting also, which persisted for several minutes.

Solutions sufficiently concentrated, from 35 to 50 per cent., caused a marked diminution of sensibility, but not as great as that induced by the application of a 5 to 10 per cent. solution of cocaine. In various cases in which both local anæsthetics were used to lessen sensibility, all the patients on whom the trials were made preferred the effects of cocaine, and suffered such disagree-

able sensations from the application of menthol as to prefer not to repeat the experience.

In acute tonsillitis, Dr. Baratoux did not obtain the good results which Dr. Rosenberg had reported, and the smarting caused by menthol was so considerable as to counterbalance any good effect.

In the nasal passages the action of menthol is less disagreeable, especially if rapid expirations are practised; the smarting is less intense, and the sensation of coolness more agreeable; the respiration becomes easier, and the swelling of the turbinated mucosa lessens. On the conjunctiva menthol has a very irritant action, and although it induces a decided anæsthesia, the effect of cocaine is both more pleasant and thorough.

Baratoux has also employed the solutions of menthol in alcohol, and petrobasaline, in the treatment of polypi of the nose and ear. As respects the ear, the pain produced by the application was great, and no diminution of sensibility resulted; but in the case of extraction of nasal polypi there was an obvious lessening of the sensibility.

Dr. Baratoux concludes that the menthol solutions are more effective in inducing anæsthesia of the nasal passages, especially when the patient rapidly inspires and expires; that they may be employed in some cases with advantage; but that they do not equal cocaine either in respect to the diminution of sensibility or the relief of local congestion.

The chief motive of Dr. Rosenberg appears to have been to find in menthol a cheaper local anæsthetic than cocaine, but since the decline in the price of the latter there is less necessity for obtaining substitutes.

It appears, further, that coca grows in such abundance, and can be cultivated with so much facility, that the needs of the world will be readily supplied in the future.

Menthol and Chloral Cones.

M. Mayer, in a recent communication to the Paris Therapeutical Society (*Revue de Thérapeutique*, October, 1885), says he has found a mixture of oil of peppermint and ether a good local application for the relief of superficial pains. He proposes, also, the following cones for topical use:

Chloral	gr. 0.50
Menthol	" 0.50
Cocao-butter	" 1
Spermaceti	" 2

These are held by a compress against the painful part.

Bismuth as an Antiseptic.

Bismuth as an antiseptic dressing for wounds, and for gastrointestinal disorder due to the action of minute organisms, and in the course of which ptomaines are produced, is attracting considerable attention. In an elaborate paper, entitled "Untersuchungen über die toxischen und therapeutischen Wirkungen des Wismuths," which appears in the *Archiv für experimentelle Pathologie und Pharmacologie*, for October, 1885, Dr. Wladimir Steinfeld gives a complete account of the actions and uses of bismuth. He precedes

the study of the physiological effects by an historical summary, which closes with the observations and experiments of Kocher (*Volkmann's klin. Vorträge*, No. 224) and of Petersen (*Deutsch. med. Wochenschrift*, 1883, No. 25, p. 367). Experiments were made on frogs, mice, rats, cats, and dogs. The systemic action was referred to the medulla oblongata, and consisted, first, in exaltation of function (heightened reflexes, tonic rigidity of the muscles, etc.) similar to the effects of picrotoxin and salts of barium, followed by depression of function, failing respiration, general muscular paralysis, lowering of the blood pressure, and arrest of the heart's action, by paralysis of the vasomotor centre in the medulla, and of the cardiac motor ganglia.

In chronic poisoning in warm-blooded animals, there ensued loss of appetite, diarrhœa, tenesmus, stomatitis, anæmia, lowered temperature, muscular cramps, and heightened reflexes, followed by paralysis, feeble circulation and respiration, and failure of the heart by paralysis of the cardiac motor ganglia. The post-mortem appearances consisted in an intense pigmentation of the mucosa, especially of the cæcum and vermiform appendix due to the deposit of sulphide and chloride of bismuth; fatty degeneration and necrosis of the epithelium of the intestinal and renal mucous membrane; blackish discoloration of the intestinal lymph vessels, and staining of the lymph corpuscles, etc.

As regards its therapeutical properties as a dressing for wounds, Steinfeld holds that it plays rather a mechanical part as a protective and a means of preventing absorption, and that it is rather doubtful as an antiseptic.

M. Gosselin (*Revue de Thérapeutique*, October 1, 1885) has found the subnitrate of bismuth dressing very efficacious in the treatment of wounds. It causes an immediate diminution of the inflammatory symptoms, arrests the sanguineous congestion succeeding operations, and induces cicatrization without suppuration. The hæmostatic action may be explained by the small quantity of nitric acid set free, which coagulates the albumen of the blood. Experience has shown that bismuth is an antiseptic, and thus the absence of suppuration may be accounted for.

Quinine in the Treatment of Whooping-cough.

Dr. Sauerhering, of Stettin (*Deutsch. med. Wochenschrift*, 1885, No. 37), proposes a method of treating whooping-cough with quinine, which he has found to cure the disease in from fifteen to twenty days. He gives the remedy in relatively large doses. For nursing children, the doses are 4 to 7 centigrammes (gr. ss–gr. j); for the second year, 7 to 10 centigrammes (gr. j–gr. jss); for the third to the fourth year, 10 to 15 centigrammes (gr. jss–gr. ij); for the fifth to the sixth year, 15 to 20 centigrammes (gr. ij–gr. iij); and from the seventh to the ninth year, 20 to 25 centigrammes. Adults receive 50 centigrammes (gr. viij). These figures are not absolute, but serve to indicate the probable amount necessary, which may be varied according to the constitution and development of the affected individuals. The medicament is administered as follows: ten powders or packets of the quinine are prepared and given, one in the evening, and three each day for the three following days. Then, after an interval of three days, by the same mode of administration, the same number are given, beginning on the evening of the third day.

Another interval of three days, and another administration in the same way follows. In this way, thirty powders are given in sixteen days. By this time the whooping-cough has usually disappeared. But in some rare cases the disease proves unusually obstinate; in that event, ten more packets are administered. Usually, a notable diminution in the number of the paroxysms is observed after the first ten packets have been administered and the three days' interval passed. But it sometimes happens that the vomiting does not cease, and then the parents of the sufferer become impatient. Habitually, after the second period of administration of the quinine and the interval, the cough lessens in the proportion of 28 to 16—even to 14; vomiting rarely occurs; the subconjunctival hemorrhages disappear, and it is only occasionally in the night that there will be paroxysms of coughing of a severity comparable to those at the onset. During the third period of the medication, often before the last day, the number of paroxysms of coughing fall to one or two, and their total disappearance soon happens. If the cough ceases during the second period of medication, it is better, that success may be assured, to administer the remedy for the third. If it happens that the packets are vomited, in part or in whole, during the first period, others should be at once given.

The statistics given by Dr. Sauerhering quite prove the success of this method of treating whooping-cough.

The Treatment of Diphtheria with Oil of Eucalyptus and Oil of Turpentine.

There is increasing evidence of the good effects obtained from the oils of eucalyptus and turpentine in the treatment of diphtheria. In a communication to the *Gazette Médicale de Nantes*, No. 11, 1885, Dr. Barthelemy explains the method as carried out in two isolated wards of the children's hospital, and gives the results.

On the stove are placed two large, deep vessels, one containing boiling water having a handful of eucalyptus leaves thrown in, and the other a mixture of tar and essence of turpentine. When the temperature does not admit of the use of the stove, an alcohol lamp is placed under a large saucepan half full of water, to which essence of turpentine and eucalyptus leaves are added, in sufficient quantity to saturate the air of the apartment with the fumes and the vapor of water. In this way the patients breathe an atmosphere thoroughly balsamic and antiseptic. Tar, and especially essence of turpentine, have been added to the eucalyptus since the publication of Dr. Conëstou's observations showing the remarkable germicide properties of air ozonized by turpentine. According to Koch, turpentine in solution (1–75000) arrests the development of the spores of charbon. Since 1880, Drs. Bosse and Satlow have employed the turpentine treatment exclusively in diphtheria. They have, it is true, used a different method of administering the remedy—giving internally as much as a teaspoonful to a tablespoonful daily, according to age (*Bull. Générale de Thérapeutique*, 1883). The plan Dr. Barthelemy has adopted does not cause any repugnance; the action is constant, and the only inconvenience is the well-known inflammability of the turpentine.

Besides these inhalations, chlorate of potassa was given internally, and almost always some quinine when the state of the temperature required it.

17 cases were subjected to this treatment with the following result: 6 proved fatal, but of these 2 were moribund on admission, and the others were in bad condition when seized with diphtheria. All of the cases of primary origin, free from complications at the onset of the disease, were cured. In 6 of the 11 successful cases, the larynx was invaded by the exudation, and in 3 of these the danger of suffocation was so imminent as to require tracheotomy.

On the Therapeutic Value of Canella in Metrorrhagia and Menorrhagia.

According to Dr. J. Chéron (*Revue de Thérapeutique*, October 15, 1885), the physiological effects of canella are the following:

Two grammes (about ʒss) of the tincture cause a feeling of well-being, a sense of warmth at the epigastrium, accompanied by a transient but agreeable general excitation. The pulse becomes fuller, but is not increased in frequency. Ingestion of a larger dose—of two to ten grammes (ʒss–ʒiij)—causes a more vivid sensation of heat at the epigastrium, and in the succeeding hour a very distinct general excitation, with some nervous agitation, rise of temperature, full pulse, scanty urine, and sweating of a critical character which terminates the systemic disturbance.

Canella is especially indicated in the menorrhagia and metrorrhagia of the chlorotic, and of the pregnant state in debilitated and lymphatic women, in the long-continued slight metrorrhagia which may succeed to delivery, and in the symptomatic metrorrhagia of cancer, of long duration and resisting other treatment.

Dr. Chéron recommends the powder of canella, with iron, in the metrorrhagia of chlorosis. It may be useful in this connection to note, that formerly canella with aloes—*pulvis aloes cum canella* (*hiera picra*, vulgo, *hickry pickry*)—had considerable repute as a remedy for amenorrhœa.

The composition of canella is especially interesting in view of its alleged utility in the affections above mentioned. It contains a bitter principle, *canellin*, and one per cent. of a volatile oil, which is made up of several oils, one of them identical with eugenic acid, present in oil of cloves.

Santonin in Amenorrhœa and Dysmenorrhœa.

Dr. J. Chéron proposes the use of santonin in the treatment of amenorrhœa and dysmenorrhœa (*Revue de Thérapeutique*, Nov. 1, 1885). He prefaces his observations on this therapeutic application of the remedy with an account of its physiological actions.

Santonin is but slightly soluble in water, but dissolves in alcohol in the proportion of 1 to 40. It is a vascular medicament, and it acts on the organic muscular fibre in the same manner as ergot. It perverts vision, and the senses of taste and odor. Objects seen have a yellowish or violet color, and the urine, which is increased in amount, has a yellow tint when acid, red when alkaline.

Santonin acts as a tonic to the stomach, and increases the appetite and the power of digestion. As is well known, it is a vermifuge, and expels the ascarides lumbricoides with certainty.

Dr. Chéron has obtained excellent results from its use in amenorrhœa and

dysmenorrhœa, more especially in cases characterized by anæmia, chlorosis, and general depression of the vital forces, about the period of puberty, when the menstrual function is tardily and imperfectly established.

He advises the following:

Santonin, ℥ss. Make 40 pills by the aid of gum-tragacanth and glycerine. Two of these are to be taken before each meal. Also,

Santonin	4 grains.
Alcohol	℥ss.
Gum julep	℥ij.

A tablespoonful contains about one grain, and two may be taken before each meal.

For Whooping-cough.

The following, applied to the orifice of the glottis in the form of spray, is said to cure whooping-cough very quickly:

Concentrated infusion of coca	f ℥iij.
Resorcin, chemically pure	℥ss.—M.

For Fetid Sweat of the Feet.

Fennel water, distilled	Oij.
Hydrate of chloral	gr. lxxv.
Borax	gr. xxx.—M.

Wash the feet with the above morning and evening.

SURGERY.

Europe.

UNDER THE CHARGE OF

FREDERICK TREVES, F.R.C.S.,
SURGEON TO, AND LECTURER ON ANATOMY AT, THE LONDON HOSPITAL.

Recent Surgical Literature.

Certain notable additions have been made to surgical literature during the last few months. In the foremost place must be mentioned two works on surgical anatomy, which will prove of the highest value to the practical surgeon: *Die Chirurgische Anatomie in ihrer beziehung zur chirurgischen Diagnostic, Pathologie und Therapie*, by Prof. Max Schuller; and *Handbuch der Topographischen Anatomie*, by Prof. Fr. Merkel. These books are being issued in parts, and the first part of each has as yet only appeared. The first instalment of Schüller's work is occupied with the upper limbs. The matter is original and well arranged. The topographical anatomy of the various parts

is dealt with only in so far as it illustrates questions of diagnosis, pathology, and treatment. The surface anatomy is very elaborately described, and the anatomy of the principal injuries and operations is admirably worked out. The fasciæ also are well described, and their influence upon the course of suppuration demonstrated by means of subfascial injections. Judging from the first part, this is the best and most complete work on surgical anatomy that has appeared in Europe.

The published part of Dr. Merkel's handbook deals only with the head, and is concerned almost solely with topographical anatomy. It contains much original matter, and the general treatment of the subject is also new. The chapters on the brain are perhaps the most valuable, and the work is illustrated by some very excellent woodcuts. At the present moment, when cerebral surgery is attracting attention, this elaborate account of the topography of the cranium is most opportune.

Diagnostic et Traitément des Tumeurs de l'Abdomen et du Bassin, by DR. J. PÉAN, Paris. This is an immense work of 1316 closely printed pages. It deals with tumors and inflammatory affections of the pelvic bones and articulations, with growths of the anterior abdominal wall, and with affections of the pelvic arteries, glands, and nerves. It embraces, also, all the disorders of the male genital organs, of the urethra, and bladder, and includes the subject of stone. It deals with affections of the vulva and vagina and with uterine tumors. The work is disappointing, verbose, diffuse, and very unequal. The chapters upon the male organs are poor and behind the time, and especially feeble is the chapter upon the bladder and stone. On the other hand, the account of the diseases of the vulva is valuable and exhaustive. Much pains have evidently been expended upon this part of the work, and the subject is illustrated by some admirable woodcuts. The chapters devoted to this matter are by far the best in the book.

The current number of BILLROTH and LUECKE'S *Deutsche Chirurgie* will not be of much interest to surgeons. It is written by Dr. Heinrich Fritsch, and deals solely with uterine disease. The subjects included in the present number are the following: Distortion and displacements of the uterus, including prolapse, acute and chronic metritis, and endometritis. The work is profusely illustrated by a number of excellent diagrams.

The current number of FOLLIN and DUPLAY'S *Traité Élémentaire de Pathologie Externe* continues the account of the diseases of the male organs. The parts dealt with are the tunica vaginalis, including the whole subject of hydrocele, the testicle, and the vesiculæ seminales. The diseases of the penis are just commenced. The work maintains its very high position as one of the most important standard works on surgery. The chapters on hydrocele are very complete. In the account of tumors of the testis, it is to be regretted that the term syphilitic sarcocele is still retained. One of the most valuable chapters in this section is that dealing with cystic disease, while one of the least complete is that concerned with enchondroma of the testis.

The last contribution to the surgical section of VOLKMANN'S *Sammlung* is written by DR. SCHUCHARDT, and concerns "*The Origin of Carcinoma from*

Chronic Inflammatory Conditions of the Mucous Membrane and Skin." The work is essentially pathological, and is one of considerable interest and importance. The author deals first with buccal and lingual psoriasis, and describes the stages of passage between this affection and carcinoma. The clinical details of this transformation are familiar, but the histological data are here for the first time, so far as we know, fully demonstrated. He then deals in the same manner with epithelioma in its relation to chronic inflammation of the skin. This leads naturally to a consideration of chimney sweeps' cancer, tar cancer (tar molluscum), and paraffine cancer. He gives details of several cases of paraffine cancer—an epithelioma that is apt to attack those engaged in paraffine factories. In all, the scrotum was involved; and in one, the skin over the right elbow. The author concludes by an account of the relation of cancer to seborrhœa (seborrhagische Hautcarcinome), and gives a description of the microscopical aspects of the parts involved in seborrhœa senilis.

De la Gastrostomie, by DR. MARCEL COHEN, is a little work that will be of use in presenting the present position of this operation in clear terms. The book contains nothing original, but it is a valuable compilation. It gives a good bibliographical index, and statistical details of fifty-three cases. The author, as the result of his investigations, advises the incision of Albert, the immediate opening of the stomach, and feeding directly after the operation.

DRS. ESMARCH and KULENKAMPFF have published in a large volume (*Die Elephantiastischen Formen*) an elaborate account of elephantiasis and conditions allied to it. The work cannot be said to present much that is new, but it forms by far the most complete compendium of these diseases that has yet appeared. Its chief value consists in the very excellent clinical illustrations that are provided, and in the numerous portraits of patients that are added at the end of the work. It forms, indeed, a clinical atlas of elephantiasis and its allies. The authors enter into the history of the disease and the bibliography, which is, by the by, somewhat voluminous. They deal with elephantiasis proper, with nævoid elephantiasis, with certain congenital tumors, with pachydermatocele, with congenital papilloma and molluscum fibrosum. Of all these conditions excellent illustrations are provided, and too high praise cannot be bestowed upon the chromo-lithographs that find a place among these illustrations.

Of English books published during the last few months, attention may be directed to *Diseases of the Tongue*, by MR. H. T. BUTLIN, and to the first part of a work on *Operative Surgery*, by SIR WILLIAM MACCORMAC.

THE ETIOLOGY OF ACUTE SUPPURATIVE INFLAMMATION.

In a case of acute osteomyelitis in the human subject, DR. GARRÉ (*Fortschritte der Medicin*, 1885, p. 105) found both the white and the yellow staphylococcus, but no other microörganisms—no streptococci. In a rapidly fatal case, moreover, he discovered the staphylococcus in the blood. As it has not been found by other observers in the blood, he imagines that it may vanish with varying degrees of fever. In some thirty cases of acute suppuration—boil, abscess, etc.—he found cocci which could not be distinguished

either by culture or in dried preparations from those of osteomyelitis. He, therefore, maintains that acute osteomyelitis possesses no specific features, and has associated with it an organism common to it and a large number of other acute suppurative affections.

He inoculated himself with the staphylococcus obtained by cultivation from a fatal case of osteomyelitis. He used a needle, and introduced the matter near the matrix of the nail. In one instance a little inflammatory swelling followed, which soon disappeared. In the second instance a large pustule followed, from the contents of which he obtained the staphylococcus. A third experiment was most important. He rubbed upon his forearm a solution containing staphylococci, derived from the fatal case of osteomyelitis. In six hours the spot so rubbed began to burn, and then at the bases of several of the hairs pustules appeared. In four days these pustules had coalesced, and had formed a somewhat serious boil. From the pus of the boil, cultivations of the yellow staphylococcus were obtained, unmixed with any other bacterium.

He concludes that both boil and carbuncle must be regarded as infectious diseases; that they are due to the same bacterium that produces osteomyelitis; and that the infection may be introduced through the excretory ducts of the skin without wound, as his third experiment upon himself appeared to demonstrate.

Tetanus Hydrophobicus.

A form of tetanus has been described under the above name, and it would appear that already some sixteen examples of the affection have been placed on record. A full account of this peculiar convulsive affection has been given by Bernhard, in the seventh volume of *Zeitschrift für klinische Medicin*. One great feature of these cases is a convulsion of the muscles concerned in swallowing, hence the name of "Kopftetanus" that is used by some. Dr. Hadlich reports a case under this title which, however, differs from the typical form of the disease by the circumstance that there were no pharyngeal convulsions.

A boy aged two and a half years, received a slight injury on the right cheek. In twelve days paralysis of the right facial nerve appeared. Three days later trismus set in. Eight days after the onset of the facial palsy distinct tetanic convulsions set in. These convulsions appeared in the paralyzed part of the face, and there was a persistent partial contraction of the orbicularis oris, the orbicularis palpebrarum, and the levator alæ nasi.

The tetanic convulsions increased up to a certain point, then lessened and disappeared.

The dragging of the face to one side was noticed for six or seven weeks, when it disappeared. The general health was not conspicuously disturbed and the child made a perfect recovery.

The State of the Urine in certain Surgical Affections.

In *Annales des mal. des org. génito-urinaires*, No. 5, 1885, are several articles that bear upon this matter. Dr. Thiriar deals with the state of the urine after abdominal operations. He states that when the amount of the chlorides

in the urine falls below 15½ grains a day, after laparotomy, septic peritonitis threatens. He gives the normal amount as 186 grains per diem, which is below that usually stated. So long as the amount of the chlorides remains above 15½ grains, there need be no great cause for uneasiness, even if certain unfavorable symptoms should exist at the time. Thiriar also asserts that in malignant tumors of the abdomen the total amount of the solids of the urine is reduced to nearly one-third of the proper quantity. So marked is this, that he goes so far as to say that malignant and simple stenoses of the pylorus can be differentiated by this test.

Dr. Verchère draws attention to the fact that in cases of delayed union of bones after fracture, there is usually a greatly increased excretion of phosphates. This fact has already been allowed in connection with certain cases of non-union, but the author goes a step further, and declares that this peculiar urine is merely a symptom of a new disease or diathesis, to which the name of phosphatic diabetes is given.

The Localization of Dermoid Cysts.

Dr. Trzebicky (*Wiener med. Wochenschrift*, 1885, No. 13) discusses this matter especially with reference to three such cysts noticed in unusual sites. One of these was discovered at the back of the head, and the other two were found in the buttock. One of the latter was close to the rectum, and led into the pelvis by a narrow stalk.

It may not be unreasonable to suggest that the first named dermoid cyst may have represented the remains of a meningocele, and, with regard to the tumors about the buttock, they suggest some connection with those congenital sacrococcygeal tumors which so often contain dermoid matters. Such tumors have presented at the outlet of the pelvis, and have been found on dissection to be connected by a pedicle with the sacrococcygeal spine.

Gunshot Wounds.

B. v. Beck, in a recent work (*Ueber die Wirkung modener Gewehrprojektile*), has entered into most elaborate considerations as to the effects upon the body of certain modern gun projectiles. The subject is illustrated by experiments upon animals. The work deals mainly with the physics of the matter, and will be of little use in the advance of military surgery. It affords evidence of very considerable labor, which will, however, be of more benefit to the gun-maker than the surgeon. A good abstract of the book appears in the *Centralblatt für Chirurgie* for July 25, 1885.

A Modification of the Continuous Suture.

Dr. Zesas (*Centralblatt f. Chirurgie*, September 26, 1885) has introduced an excellent modification of the continuous suture. He uses a straight three-edged needle, and, as a suture material, sublimate silk. He begins at one end of the wound by a button suture (*a*), and then applies a quilt suture (Matratzennaht) along the whole length of the incision, as shown in Fig. 1. The wound edges are now drawn together, and the thread carried back to the point (*a*) by means of the ordinary continuous suture, as shown in Fig. 2.

By this suture more than the mere edges of the wound are brought together, and bagging of inflammatory material is almost entirely prevented. Dr. Zesas

Fig. 1.

Fig. 2.

has used this suture in a large series of wounds, and speaks in very high praise of it.

Congenital Fracture and Dislocation of the Atlas.

Dr. Wm. Allen (*Lancet*, October 24, 1885, p. 751) furnishes the most complete account of this somewhat rare condition with which we are acquainted.

The condition has been described by Guérin, who considered it to be probably due to a sliding of the condyles forward with elongation of the anterior ligaments. In the infant the subject of Guérin's remarks, there was such extreme extension of the head that "the head was exactly applied against the posterior part of the neck and upper part of the back." In two specimens of infants examined by Dr. Allen, there was a similar exaggerated degree of extension. Dr. Allen discusses in great detail the anatomy and etiology of the deformity, and brings his paper to an end by the following summary: 1. The injury may be expected to be present if an exaggerated degree of extension of the head is permitted, and more especially if forcible extension of the head or pressure on it from above induces a species of epileptic fit. 2. Probably the fits are due to pressure on the cord at the level of the fracture of the head and spine. At any rate, examination of dissected specimens shows that when the condition of parts permits the head to be bent backward on the spine more than is usual, the osseous and ligamentous structures cause a "dimpling in" of the meninges behind, sufficient to produce considerable narrowing of the canal at this level. 3. Anatomical defect of the atlas, or slenderness of the posterior arch, predisposes to the injury. 4. The fracture-dislocation is

produced by the posteriorly diverging occipital condyles being driven wedge-like between the atlantal lateral masses. This wedge-like action of the combined condyles stretches out the long axis of the oval ring of the atlas, and tends to produce rupture between its lateral halves; but the transverse ligament keeps the strain off the anterior arch, so that only the posterior arch gives way (constituting the fracture), and then the wedge-like action of the condyles, continuing, forces the back ends of the lateral masses outward from between the occiput and axis. Thus the production of dislocation closely follows the fracturing of the arch. 5. At birth the injury is most liable to be produced. Uterine contraction acting during parturition on an extended head (as in face presentations), presents mechanical arrangements from which such a result is highly probable.

Spontaneous Dislocation of the Hip.

Prof. Roser (*Centralblatt für Chirurgie*, August 15, 1885) claims to have demonstrated a new cause for spontaneous luxation at the hip-joint. He has observed three cases in which the femur became spontaneously dislocated in patients suffering from Pott's disease.

It is well known that when the cord becomes affected in this disease, that complication may be attended by tonic and clonic muscular spasms. It is to these muscular movements—especially to such as take the form of abiding contractions—that the luxation is considered to be due. The dislocation is backward, and is of slow and painless formation. There is no swelling of the joint, no signs of hip-disease, and none of the wearing away of bone that is a feature of Charcot's disease.

Tracheotomy.

Dr. Birnbaum (*Archiv für klin. Chirurgie*, Bd. 31, Heft 2) contributes a statistical paper upon the results of this operation. The paper deals with 140 cases, and covers a period of ten years. As regards the indications given for the operation and the details of the procedure, there is nothing new. A tube is recommended which is practically identical with one introduced by Bose. Steam inhalation forms an important feature in the after-treatment.

Tables are given to show the influence of age, sex, and season upon the operation, but they do not adduce any facts of practical interest. Of the 140 children, 93 died, a mortality of 60.4 per cent. In only 2 cases was there serious bleeding, and in 1 of these death followed. In 7 patients scarlet fever appeared shortly after the operation.

The Treatment of Purulent Pericarditis by Incision.

A case of pericarditis treated by incision is reported by Dr. Michailoff (*Medizinskoje Obosrenje*, 1885, No. 5). It unfortunately ended fatally. The instances in which this treatment has been adopted are still few, and as the operation is entirely upon the lines of the most recent advances in surgery, and as it has been most successful in some cases, the present report is worthy of notice. The patient was a female, aged thirty-five. In addition to the pericarditis she was suffering from enlarged liver, anasarca, and albuminuria,

and was cyanosed. A puncture into the pericardium was made in the fourth intercostal space and 2¾ ounces of pus evacuated. The relief afforded was temporary. On the second day the pericardium was incised. The incision was four-fifths of an inch long, and was made in the fourth intercostal space close to the sternum. Two pounds of bloody pus escaped. The pericardial cavity was washed out with resorcine and well drained. The patient was at first relieved, but died collapsed in eighteen hours. The autopsy revealed a fatty and dilated heart and right hydrothorax.

Primary Chancres of the Palate.

Dr. Burow (*Monatsschrift für Ohrenheilkunde*, Bd. 19) reports no less than six cases in which primary syphilis was communicated to patients by means of an infected Eustachian catheter. The sore in each instance appeared upon the palate or pharynx.

Cartilaginous Tumors of the Upper Jaw.

M. Paul Berger (*Bull. de la Soc. de Chir.*, Paris, 1885), after giving an account of a case of resection of the upper jaw for chondroma, proceeds to analyze the reported cases of this form of tumors.

He finds 31 cases on record of removal of the superior maxilla for so-called "cartilaginous" growths. Of this number 7 are so imperfectly reported as to be of no value. Of the remaining 24, 19 were described as pure chondromata, 2 as osteoid chondromata, and 3 as chondro-sarcomata.

Of the first named series of 19, 5 were fibro-cartilaginous, 6 were in process of ossification, and 8 were composed of pure hyaline cartilage. This variety of tumor is of slow growth—the duration of the neoplasm varying from one to thirty-six years—and may attain great size. It shows no disposition to recur after complete removal.

The remaining 5 cases appear to have been examples of chondifying sarcoma, with some calcification in two instances (osteoid growths). These were of rapid growth—the duration varying between four months and two years—and showed a disposition to recur after removal.

Speaking generally, the author states that the most common point of origin of chondromata in this region is from the alveolar process, but the neoplasm may grow from any part of the bone. In three instances the tumors commenced in the ethmoid bone and invaded the jaw subsequently.

Nerve Suturing.

Dr. Rawa (*Wiener med. Wochens.*, 1885, No. 11) finds fault with the present means adopted for bringing together divided nerves. He points out that when the divided nerve is at the same time crushed, so much of the nerve tissue may have to be cut away that a close approximation of the divided ends is not possible. He is of opinion, also, that the sutures introduced into the nerve substance act injuriously.

He, therefore, proposes the following operation, the details of which he has carried out upon animals: After the nerve ends have been laid bare, a loop of catgut is placed around either end at a distance of about ⅔ of an inch from

the cut extremity. These loops include also the connective tissue around the nerve, and they are only drawn sufficiently tight to prevent them from slipping.

The ends of the catgut loops are then tied together, and the nerve ends so approximated. He states that the results obtained in animals by this procedure were invariably good.

It is to be noticed, however, that perfect restoration was only obtained at the end of several months. There is little to commend this operation. If it appeared—in a recent case of wound—that the nerve ends were so damaged that so large a quantity would have to be cut away as to prevent the approximation of these ends, one would imagine that the attempt at suture would be deferred until the extent of the damage has been ascertained. One would expect, also, that a tight ligature around a damaged nerve would increase rather than diminish its prospects of restoration. It is, however, very doubtful whether sutures applied in the long axis of a nerve in reality do more harm than a ligature secured firmly about it.

The Trophic Disturbances in Tabes Dorsalis.

Dr. Hoffman (*Berliner med. Wochen.*, 1885, No. 12) is disposed to recognize other peripheral changes than Charcot's joint disease, perforating ulcer of the foot, etc., as occasional phenomena of locomotor ataxia.

His paper is of much surgical interest, but his data are scanty, and his conclusions are open to some question. His chief points are the following:

1. Spontaneous rupture of the tendo Achillis may occur in tabes. He cites the case of a tabetic man, who suffered rupture of this tendon while turning round in the street. The patient had been the subject of syphilis, and there is no evidence to show that the rupture was not independent of the cord affection, and that it was not due to syphilitic disease in the tendon itself.

2. The teeth may fall out in the subjects of tabes. The case is quoted of a man whose teeth came out without pain and without his having been troubled with caries or toothache. They were lost upon both sides, and a wasting of the alveolus followed. The patient also had been a subject of syphilis.

3. The arthritic lesion may appear suddenly in the subjects of tabes. The patient whose case illustrates this proposition, was turning over in bed when he experienced a loud crack in his hip, and was suddenly attacked with pain in the part. Much swelling followed, with great lameness and with shortening of the limb. The patient had had syphilis. It must be confessed that this case presents all the features of a fracture of the neck of the femur, and it is well known that in certain subjects this accident has happened in the identical manner described.

Odorless Iodoform.

Dr. Oppler (*Centralblatt für Chirurgie*, July 25, 1885) claims to have introduced an odorless iodoform. The smell of iodoform offers a serious objection to its more general use in practice, and the attempts that have up to the present time been made to render the drug odorless have been but partially successful. In the mixtures of iodoform with Tonquin bean, balsam of Tolu, oil of peppermint, etc., the peculiar smell of the drug is still to be observed.

Dr. Oppler mixes the iodoform with finely powdered coffee, and maintains that by this admixture the odor of the iodoform is entirely lost. The powder is composed of one part of coffee to two parts of iodoform. The coffee should be fresh roasted, and must be very finely pulverized in a mortar. By the use of coffee powder, also, the ointment of iodoform can be rendered free from smell. Dr. Oppler maintains that coffee as a local application acts as a mild antiseptic. We have tried this mixture and find that the smell of the drug is entirely lost as Dr. Oppler claims.

A New Injury.

M. Bouilly (*Ann. Méd.-Chir.*, 1885, No. 2) claims to have discovered a new surgical lesion, a sprain of the superior tibio-fibular joint. He has met with one example of it. A man, aged sixty, slipped on the street, but saved himself from falling by a sudden and vigorous bending of the body backward. He at once experienced violent pain in the region of the knees, which pain increased rather than abated during the next few days. On the outer side of the right knee, in the situation of the superior tibio-fibular joint, was an ecchymosis, and about this point there were some swelling and considerable tenderness on pressure. The knee-joint itself appeared to be perfectly sound. Similar phenomena were to be noticed—but in a slighter degree—upon the left side. Conclusions founded upon the experience of a solitary case are apt to be misleading, and it must be confessed that the symptoms present in M. Bouilly's patient are susceptible of more than one explanation.

The Results of Osteotomy.

Dr. Hofmokl (*Archiv für Kinderheilkunde*, 1885, Bd. vi.) gives the details of 52 operations upon deformed bones in 26 individuals. The operations are thus divided: osteoclasty 10; linear osteotomy 31, and osteoectomy 11. 10 of the patients were males and 16 were females. Their ages ranged between 2 and 23 years. In 18 cases in children (between 2 and 8 years) the operations were undertaken for rachitic deformities, and in 8 cases in adults for genu valgum or varum.

Of the 10 osteoclasties, 3 failed on account of the firmness of the bone, and the remaining 7 did well. Of the other 42 operations, 21 were linear osteotomies of the bones of the leg, and 11 were examples of Macewen's osteotomy of the femur; 11 were osteoectomies. Of this number 31 healed by first intention, 10 by second intention, and 1 died of pyæmia. Dr. Hofmokl considers that the chief obstacle to healing by first intention is bleeding from the bones, and to prevent this he fixes the limb for 8 or 10 days in a very elevated position; and in children he adopts vertical suspension of the limb. He advises that in young patients some supporting apparatus should be worn for a considerable period after the healing of the wound. He divides the treatment of genu valgum and varum into three categories according to the severity of the case. (1) The use of apparatus and elastic accumulators. (2) *Redressement forcé* with or without tenotomy. (3) Osteotomy. He is entirely in favor of Macewen's operation. He advises the use of a supporting apparatus for some three months after the operation. He points out

that the callus produced when suppuration had occurred was stronger and firmer than that met with when the parts healed by first intention.

MR. WILLETT (*St. Barth. Hosp. Reports*, vol. xx. p. 59) gives an account of 101 osteotomies. The results were exceedingly satisfactory. Mr. Willett prefers Macewen's operation to Ogsten's in the treatment of genu valgum and varum, and, indeed, this list includes only 3 examples of the latter operation. Ten operations were performed for the relief of ankylosis at the hip-joint. In six instances the neck of the femur was divided by Adam's method. For this operation Mr. Willett uses the saw in preference to the chisel. In the remaining 4 cases the femur was divided below the trochanters. One death followed, and in the remaining cases an excellent result ensued.

THE TREATMENT OF TUMORS OF THE BLADDER.

A discussion upon this subject was opened at the British Medical Association Meeting at Cardiff, by MR. REGINALD HARRISON (*British Medical Journal*, August 15, 1885). Mr. Harrison's paper presented an epitome of his well-known views upon the subject, and discussed the operations with which his name is so honorably connected. The discussion that followed the paper did not elicit any matters of importance. Mr. Harrison divides vesical growths into two classes. (1) Those which, during their entire existence, or for a portion of it, occasion either slight or no distinct indications of their presence, and (2) those which declare themselves by symptoms either seriously disturbing the function of micturition, or which, by their constancy or degree, threaten the life of the patient. It is to the latter class of growth alone that treatment is directed. The mere subjective evidence that a person has a tumor in the bladder, will not warrant the adoption of any operative measures to effect its removal. Mr. Harrison concerns himself solely with non-malignant growths, and does not enter into the question of excision of portions of the vesical wall. He advocates digital exploration when it can fulfil at least three objects: (1) the relief of symptoms which are otherwise irremediable; (2) verifying the diagnosis of tumor; (3) determining whether the removal of the growth can be proceeded with. As Mr. Harrison points out, even in cases of epithelioma, the incision required to allow a digital examination affords often great relief by draining the bladder, and relieving the patient of the cystitis produced by decomposing urine. He strongly advises, both for exploratory and operative purposes, median perineal urethrotomy in preference to the suprapubic operation. Mr. Harrison has introduced a very ingenious pair of forceps for the removal of growths when the interior of the bladder has been opened up. The details of the operation remain the same.

LITHOLAPAXY WITH COCAINE.

An interesting case of this operation is reported by PROF. BRUNS, in *Berliner med. Wochenschr.*, 1885, No. 21. A two per cent. solution of cocaine was introduced into the bladder and also into the urethra. The calculus proved to be composed of oxalate of lime, and was exceedingly hard. Thirty-three separate crushings were executed in twenty-two minutes, without any pain having been felt. The patient began to complain of pain thirty minutes after

the commencement of the operation, as the fragments were being washed away. The pain, however, was quite slight. After the operation a ten per cent. emulsion of glycerine and iodoform was injected. The litholapaxy was followed by complete success.

Enlarged Prostate Treated by Electrolysis.

At the commencement of the present year Prof. Bottini published an account of a case in which the symptoms produced by enlarged prostate were removed by destroying some part of the prostate by the galvanic cautery. The operation practically consisted in burning out a new prostatic urethra, An abstract of Bottini's paper appears in this Journal for July, 1885.

Recently Dr. Cæsar Musati has published another example of this operation (*Centralb. für Chirurgie*, July 11, 1885). The great interest of the case consists in the fact that the operation was performed upon Dr. Musati himself by Prof. Bottini. Dr. Musati had been for some time troubled by the usual symptoms that attend enlarged prostate, and the operation gave him complete relief. No anæsthetic was employed, and Dr. Musati states that the pain felt at the time of the operation was by no means severe.

Time alone can demonstrate the real value of this procedure, which, however, appears to be simple and safe.

Mutilocular Hydrocele.

Dr. Steinthal (*Centralblatt für Chirurgie*, Oct. 10, 1885) describes two examples of this rare affection. The first case was that of a man, aged twenty-two, who, when fourteen years old, received a wound of the scrotum. A hydrocele followed, which had been tapped many times. It was finally treated by the radical operation (incision of the sac). When the main sac was opened there was seen at the bottom of it a mass composed of a multitude of cysts; the largest of these were the size of a cherrystone. They contained a clear white fluid. The mass was removed; the testis was untouched and appeared to be perfectly normal; a permanent cure followed. The second case was that of man aged twenty. The radical operation was performed, and the local condition was in all essential points identical with that just named. This form of hydrocele has been often described, but previous to Dr. Steinthal's paper no account appears to have been furnished of the microscopic appearances. On microscopic examination the minute cysts were found to be lined with a layer of fine endothelium, and were embedded in a vascular connective tissue rich in cells. From one of the cysts cords were noticed to be running, which were made up of endothelial cells; another space contained a lymph thrombus. From these appearances Dr. Steinthal concludes that the cysts have developed from dilated lymph vessels, and he gives to the condition the name of cystoid lymphangioma.

He is disposed to think that the disease is acquired and not congenital, and that it may be induced in the first instance by some inflammatory process.

Splenectomy.

It is sincerely to be regretted that some surgeons, in spite of the very clear experience of the past, continue to excise spleens in cases of leucæmia. The

operation has been performed often enough to satisfy the most sceptical, and in no single instance has the patient recovered. The last addition to this terrible series of deaths has been made by Rydygier. An account of the case is published by Dr. Biziel, in *Przeglad lekarski*, 1885, No. 14. The patient was a woman aged thirty-one. Splenic enlargement had been noticed for about three years. She had pronounced leucæmia. The operation was performed without difficulty, and the patient died in twenty-four hours.

Diaphragmatic Hernia.

An interesting case of this somewhat rare rupture is reported by Drs. Galassi and Teneri, in *Lo Sperimentale*, 1885, No. 3. The patient was a woman, aged twenty-eight. She was seized with sudden abdominal pain, followed by vomiting and constipation. The examination of the thorax (which must have been very loosely conducted) revealed nothing. Both the right and the left side of the colon were found to be full. The symptoms of intestinal obstruction increased, and on the seventh day of the disease laparotomy was performed. There was no peritonitis. The result of the laparotomy was that the cause of the obstruction was not detected. The patient died on the following day. At the time of her death there appears to have been no suspicion that she suffered from diaphragmatic hernia. Such a rupture, however, was revealed at the autopsy; and was apparently of congenital origin. The transverse colon was found in the left pleural cavity, and had become occluded by kinking. It is to be regretted that the patient was not subjected to a more careful examination, and that the laparotomy had not been more systematically carried out This is probably the first instance of laparotomy for diaphragmatic hernia.

Resection of Intestine for Wound.

The operator was Dr. Kwiencinski (*Przeglad lekarski*, 1885, No. 5). The patient, a man aged twenty, was stabbed in the abdomen. Through the wound a metre of small intestine protruded, in which four wounds were discovered. Two of these wounds were closed by suture, but the remaining two were so close together that suture was impossible. The involved segment was therefore resected. The divided ends were united by suture, the bowel returned, and the abdomen closed. The patient made a good recovery. This case makes another link in the chain of argument for the treatment of these cases by resection—a treatment that has been so admirably illustrated by the practice of Bull, of New York; Kocker, of Berne; Annandale, of Edinburgh, and others.

Sarcoma of the Bowel.

Dr. Bessel-Hagen (Virchow's *Archiv*, Bd. xcix. Heft 1) reports the case of a boy aged seven, who, some little time after having received an injury to the abdomen, developed a tumor about the damaged spot. He rapidly became marasmic, and died in four months. The autopsy revealed a sarcomatous growth in the jejunum of the size of the fist. It was of the small round-celled variety, and sprang from the submucous tissue. There were

many secondary deposits. The case is of interest in connection with the supposed influence of the injury and the rapid progress of the disease, apart from the great rarity of these neoplasms in the bowel.

The Radical Cure of Hernia.

Mr. Keetley (*Brit. Med. Journal*, September 19, 1885) advocates a modified form of what is known as the injection treatment. The treatment of reducible ruptures by injecting some irritant fluid into the tissues about the hernial orifice was first introduced by Dr. Heaton in 1832, and subsequently advocated with obtrusive vigor by Dr. Warren. The measure never appears to have taken any hold of the surgical mind in this country. In Germany it has been adopted, and has received a considerable number of supporters. Last year Dr. Schwalbe published a treatise (*Die Radikale Heilung der Unterleibsbruche*) advocating this measure. It appears from this paper that the treatment must extend over a period varying from two to twelve months, and that on an average twenty injections are required in each case.

Apart from the tedious character of the proceeding, these operations are attended with danger, in that the injection is made blindly, and no security is offered to insure the non-entrance of the fluid into the sac or into the peritoneum. Mr. Keetley's procedure removes the principal objections brought against the injection method. He does not make his injection blindly. He cuts down upon the inguinal ring, and thrusts a probe through the undivided intercolumnar fascia into the inguinal canal. Along the probe is introduced a canula, and through the canula the fluid is injected into the canal. Mr. Keetley uses a freshly prepared concentrated decoction of oak bark. After the injection, the pillars of the external ring are brought together by two catgut sutures. Mr. Keetley has operated upon eleven cases, and in two only has the result "fallen short of complete success." All these operations have been performed during the past twelve months, and it is obvious that sufficient time has not yet elapsed to allow of the value of the operation being judged. It is difficult, also, in these cases, to separate the effect of the injection from the effect of the closure of the external ring. In cases in which injection alone has been used, repeated injections have been required to effect a cure, and little has been done by one application.

The Mechanical Closure of Artificial Anus.

Dr. Teleky (*Wiener med. Blätter*, 1885, No. 9) writes upon this subject. It must be allowed that the various pads, trusses, and receptacles that have been devised for the artificial anus after lumbar colotomy do not very efficiently fulfil their intentions. In actual practice the patient very commonly discards them all, and adopts some simple arrangement of his own. Dr. Teleky has added another apparatus to the list. It consists of two India-rubber balls, which are united by a short, thick, narrow and solid stem. One of the balls lies within the gut, and serves to close its lumen; the other, the larger, lies upon the wound, which it covers and protects. The stem occupies the sinus between the skin-wound and the gut lumen, and must, obviously, be very short. The balls are introduced empty and are inflated *in situ*. They

do not communicate, but are inflated separately. It is doubtful if this apparatus will answer much better than the previous ones, and the advisability of retaining a foreign body in the bowel may be open to question.

AMERICA.

UNDER THE CHARGE OF

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A CASE OF ENUCLEATION, WITH REPLACEMENT OF THE HUMAN GLOBE BY THAT OF A RABBIT.

DR. H. W. BRADFORD, Asst. Surg. Mass. Eye and Ear Infirmary, records, in the *Boston Med. and Surg. Journal*, Sept. 17, 1885, a case of operation, done August 9th, upon a patient thirty-five years old, whose right eye had become very much atrophied in consequence of an injury received in early childhood.

The enucleation was done in the usual manner, but a suture was passed through the tendon of each rectus muscle, and one through the optic nerve, before its division.

The rabbit's eye was removed through a circular incision in the conjunctiva $\frac{1}{2}$ of an inch from the corneal border, the tendons were cut close to the globe, and the nerve at about $\frac{3}{10}$ of an inch from the sclerotic. Then the cavity of the patient's orbit was partly filled with albumen from a fresh egg, and the rabbit's eye was dipped in the same. The ends of the optic nerves were brought together by a suture secured by a slip-noose, the tendons of the recti sutured to the subconjunctival tissue in appropriate positions, and the conjunctivæ united to each other by four sutures. [Apparently the sutures were of silk.]

The lids having been dried, iodoform was dusted over them, and a pad of absorbent cotton and flannel bandage applied.

The dressings were undisturbed until the seventh day, when the cornea presented a slight haziness, and was covered by the chemosed conjunctiva, except on the outer side, where the suture of the external rectus had cut out and allowed the muscle to retract and draw the conjunctiva backward; the movement of the eye was good in all directions, except that divergence was imperfect. The sutures were withdrawn from the nerve and the upper and internal recti; instillation of atropine; reapplication of the dressing.

On the twelfth day the cornea was less hazy; the conjunctiva well united; the movements of the globe satisfactory.

The report ends on the eighteenth day. Conformation and tension good; cornea improving, and has cleared peripherally, so as to allow the iris to be distinctly seen; conjunctiva congested; ocular movements in all directions good.

It is suggested that the operation may be valuable not only for corrective effects, but also in young children, to prevent arrest of development of the orbit; and for this purpose Dr. Bradford proposes that the eye of a young dog should be taken, in the hope that it would continue to increase in size after transplantation.

It is unfortunate that the report ends so soon after the operation (the eighteenth day), for at the meeting of the Paris Académie de Médecine, May 26, 1885, Dr. Chibret reported a successful operation of the same kind, done on the 4th May, twenty-two days before, and yet subsequent reports inform us that the cornea finally sloughed.

In the *Bulletin de la Société de Chirurgie*, for Aug. 12, 1885, p. 592, mention is made of the receipt of the report of a case of the same kind by Rohmer, the eye of a dog being used. The cornea sloughed on the seventh day, and the globe became atrophied.

Incised Wound of Abdomen and Colon; Recovery.

Dr. T. W. Compton, in the *New Orleans Med. and Surg. Journal*, Nov. 1885, p. 363, records a striking example of recovery from a severe wound and prolonged exposure of the intestines, without the aid of any of the antiseptic measures to which so much importance is now so generally, and so rightly, attached. The patient, a negro, received a transverse razor-cut in the abdomen, two inches long, about two and a half inches from the umbilicus, through which twenty inches of the colon protruded. The gut was cut in half, transversely, with two small cuts on the opposite side made from within outward by the point of the razor. The patient remained five hours without treatment, the gut protruding and covered only with a soiled handkerchief. The incisions in the gut were closed with silk sutures, one end of that closing the large one being left long. It was then returned, after enlargement of the abdominal wound, the long incision in the gut being held against the abdominal incision by the end of the suture, which was brought out through the external wound and fastened to the skin by adhesive plaster. The abdominal wound was closed with three stitches, and covered with a dry compress. Recovery took place without incident, and was complete in five weeks. The first movement of the bowels was on the seventeenth day. The dry compress was removed by soaking on the fifth day, and another substituted. No suppuration of the external wound, except along the track of the end of the intestinal suture.

Two other cases of laparotomy and suture of the intestine in the treatment of gunshot wounds of the abdomen, have been recently reported.

In the first, under the care of Dr. J. B. Hamilton, of Washington, D. C., (*Journ. Am. Med. Assoc.*, Aug. 22, 1885) the patient was a mulatto, nineteen years old, and the bullet, of thirty-two calibre, entered the abdomen an inch above and to the right of the navel. The operation was done two hours after receipt of the injury. A six-inch incision was made in the median line, through which the intestine was drawn out and examined. Eleven wounds were found in the small intestine and two in the ascending colon, and closed with sutures. A wounded artery in the mesentery was tied, and a wounded portion of the omentum ligatured *en masse* and cut away. A large amount of blood found in the abdominal cavity was removed, the cavity sponged with a solution of bichloride of mercury, the intestine returned, and the external wound closed. On the thirteenth day great rectal tenesmus appeared, due to the presence of a tumor in the pelvis. This tumor was incised through the rectum two inches above the anus, and proved to be composed of thin, badly smelling blood, which escaped to the amount of about three

pints. The patient recovered, and apparently no fecal extravasation had taken place, although a melon seed was found in the peritoneal cavity.

In the second case, recorded by Dr. D. A. V. Park, in the *Chicago Med. Journ. and Examiner*, Nov. 1885, p. 412, the patient was a lad sixteen years old, and the bullet, twenty-two calibre, entered two inches to the left of the median line midway between the pubes and navel. The operation was done twenty-two hours after the receipt of the injury. An incision four inches long, parallel to the median line, was made through the wound. A large amount of decomposed blood, which promptly clotted on exposure to the air, was found within the abdominal cavity, a bleeding artery in the mesentery secured, and a half-inch wound in the small intestine closed by sutures. The operation was done with great attention to cleanliness, but not antiseptically, in the strict sense. No fecal extravasation recognized. The patient died about fifteen hours after the operation with commencing general peritonitis. The autopsy showed that the cavity had not been entirely cleaned of blood, and that another perforation of the intestine (p. 465), and a bruise of the rectum had been overlooked.

In still another case, in the practice of Dr. E. Andrews (*Journ. Am. Med. Assoc.*, Aug. 15, 1885), an exploratory incision was made in the median line above the umbilicus for probable pistolshot wound of the stomach. No wound of stomach or intestines was found, and, after removal of a considerable quantity of bloody serum, the external incision was closed. The patient recovered. The wound was made by a thirty-eight calibre ball at the edge of cartilages of the ribs, above and to the left of the umbilicus. The ball passed entirely through the body, coming out at the back on the same side, and the point at which it entered the peritoneal cavity was recognized during the operation.

Cholecystotomy.

Dr. A. C. Bernay records in the *Weekly Medical Rev.*, Oct. 31, 1885, p. 350, the case of a woman aged forty-six years, in whom a tumor appeared as a lump in the median line above the navel, three years ago, but had grown only during the six months preceding the operation. It was as large as a goose egg, smooth, hard, and movable. An exploratory incision was made in the median line, beginning one inch below the ensiform cartilage, the tumor drawn out, punctured, and then incised. About one pint of clear mucus escaped, with twenty small gall-stones. A large stone was found impacted in the gut, and was removed after slitting the folds which partly covered it. The incision in the sac was closed with a double row of silk sutures, the sac returned, and the external wound closed. The patient vomited a large quantity of bile the night following the operation; recovery was complete by the twenty-first day.

Astragaloid Osteotomy in the Treatment of Flatfoot.

Mr. William Stokes, F.R.C.S., in an article in the *Annals of Surgery*, Oct. 1885, contributes the anatomical description of the calcaneum and astragalus taken from the body of a person affected with flatfoot, and the

account of an operation successfully performed by himself in another case, and briefly discusses the etiology of the affection.

The specimen showed the head of the astragalus directed downward, its articular surface in contact with the inferior calcaneo-scaphoid ligament, and a new articular facet on its upper and now anterior surface for articulation with the somewhat hypertrophied scaphoid. The sustentaculum tali, instead of being horizontal, was directed downward and forward, the head of the astragalus was enlarged, and the upper surface of its neck was lengthened.

The patient upon whom he operated was a strongly built, healthy lad, fourteen years old, with well-marked flatfoot on one side, who complained greatly of pain in the foot, especially in the medio-tarsal joint, after walking or standing for even a short time.

The operation consisted in removal, with strict antiseptic precautions, of enough of the articular end of the head of the astragalus to allow the foot to be brought into a correct position. The wound healed without suppuration, the foot being kept adducted, and the result at the end of six months was excellent and promised to be permanent, the boy being then able to walk or run as well as any.

The author rejects the theories of ligamentous relaxation and muscular paralysis, and accepts that of primary osseous deformation.

Many desirable details are lacking in the history of the specimen and the case, but the operation may be readily accepted as a proper one when the malposition of the foot cannot otherwise be corrected. The changes in the bones of the specimen may, however, be fairly deemed the result rather than the cause of the deformity, although when they are present they may make operative treatment necessary.

Without entering into a discussion of the etiology, attention may be called to the usual sequence of symptoms in acquired flatfooted valgus. In the normal evolution of the shape and position of the foot after birth the original position of varus disappears, and pronation is more free than supination. This change is in the direction of valgus. Roberts has found valgus in one and a half per cent. of children at the age of eight years, and in thirteen and a half at the age of twelve. Painful valgus is practically limited to adolescents (Gosselin terms it *tarsalgie des adolescents*), and is by far the most common in those who have to stand or walk or carry heavy burdens. It is characterized in its early stage by pain at the medio-tarsal joint, appearing only after the patient has stood or walked for a long time, and promptly disappearing during rest. A chance post-mortem of one such case in the first stage (Gosselin, *Bull. de l'Académie de Médecine*, 1865, p. 144) showed the signs of an arthritis of the medio-tarsal joint. To this stage regularly succeed others in which the valgus becomes more marked, and finally permanent, with or without contraction of the anterior and peroneal muscles of the leg, and preservation of the arch of the foot. Softening and elongation of ligaments are common results of arthritis.

That the head of the astragalus should lengthen in the direction in which it is no longer opposed by the scaphoid, is in keeping with changes in other bones under similar circumstances, notably with the projection of the femoral condyles in subluxation of the tibia, and that altered lines of pressure should modify the shape of the calcaneum is also in keeping with other pathological data.

Reproduction of Two and Three-fourths Inches of the Clavicle by Grafting with Periosteum and Bits of Bone taken from Dogs.

Dr. C. W. Trueheart, of Galveston, Texas, records in the *Med. Record* for Oct. 3, 1885, a case operated upon in 1876. The patient lost nearly four inches of the central portion of the left clavicle by a gunshot wound, and after recovery found himself much disabled by the lack of support of the shoulder. The cicatrix was cut out, leaving a wound three-quarters of an inch deep, one inch wide, and two and three-quarters inches long between the ends of the bone. After a bed of granulations had formed upon its surface, it was covered with periosteal and thin bony grafts the size of hempseed, taken from the limbs and shoulder-blades of dogs, and placed at intervals of about three-eighths of an inch, the shoulder being supported by an axillary pad. On the fifth day seven or eight out of every ten grafts were found to have "taken," and after they had been covered in by the spread of the adjoining granulations, a second series was applied. Three such graftings were done, and then, the wound having become filled, its cicatrization was hastened by skin grafting. Two months later the gap appeared to be completely filled out by a firm tissue of bony consistency, and measurement of the two clavicles showed shortening of only a quarter of an inch on the injured side. A recent examination of the patient shows no change except an angular deformity due to a fracture of the new-formed section caused by a fall a few months ago.

Contribution to the Etiology of Malignant Tumors.

Dr. R. J. Hall, of New York, published in *The Medical News* for Oct. 31, 1885, p. 478, a thoughtful, well-constructed argument in favor of the theory that malignant tumors have their origin in a bacillary infection, and are, therefore, communicable from the patient to others. The argument consists of a criticism of the alternative theories, of the histories of eight cases of supposed communication, of various instances of experimental and of "contact" infection, and finally of the discovery of bacilli in a case of large-celled sarcoma. The analogy with tuberculosis, and especially the history of the germ theory of tuberculosis, are also quoted in support.

All these arguments are advanced with caution, and with an appreciation of their shortcomings, which speaks highly in favor of the spirit in which the author has treated the subject, and makes criticism unnecessary.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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Contributions to the Study of the Embryology of the Eye.

Dr. Real y Begro's investigations (*Recueil d'ophthal.*, August, 1885) were conducted mainly upon animals, and from them he deduces the following

conclusions: 1st. The vitreous body of the embryo is not formed by a mesodermic bud or shoot which penetrates into the cavity of the secondary ocular vesicle through the fœtal fissure, but is formed by the chorio-capillaris which accompanies the distal wall of the primary ocular vesicle during its invagination. It is, therefore, formed by a vascular plexus which exudes gradually a hyaline substance which fills its meshes. 2d. The network of the posterior vascular membrane of the lens and the hyaloid artery are the last vestiges of the plexus of the vitreous. 3d. The capsulo-pupillary membrane is a dependence of the plexus of the embryonal vitreous body, and its development occurs *pari passu* with that of the lens. 4th. The retinal vessels do not arise from the plexus of the vitreous body, but from the central vessels at the level of the optic papilla. 5th. The zonula and the hyaloid membrane form a differentiation of the hyaline substance of the vitreous. 6th. The comb in the eye of birds is the homologue of the plexus of the vitreous body of mammals. 7th. In birds there is no pupillary membrane nor vascular capsule of the lens.

Extirpation of the Entire Lachrymal Gland.

Badal (*Arch. d'ophthal.*, Sept.–Oct. 1885) draws the following conclusions from a consideration of this subject: 1st. The orbital portion of the lachrymal gland is perfectly isolated from the palpebral portion by its fibrous sheath, and its complete extirpation presents no serious difficulty or danger. 2d. It is very difficult to remove all the lobules of the accessory portion, distributed and almost lost in the thickness of the lid. 3d. The removal of the orbital portion has no effect upon the lubrifaction of the eye, but only abolishes the power to weep. 4th. It is possible that the function of this portion of the gland is solely to secrete tears. 5th. The accessory gland, in connection with the other glands of the lids, presides over the lubrifaction of the eye. Its permanent and regular secretion is but little or at all modified by those sources of irritation which excite the activity of the orbital gland. Hence, that part of the gland known as *accessory* would be the more important of the two; while the orbital portion would be considered as the *real lachrymal* gland, but of secondary importance. 6th. The excretory canals of the orbital and palpebral portions are more numerous than is generally thought by modern authors. 7th. It is certain that a portion at least of the canals coming from the orbital gland are not joined by the canals coming from the palpebral portion. 8th. The removal of the palpebral portion of the gland might be attempted in those cases in which the extirpation of the orbital gland had failed to relieve a painful lachrymation. 9th. The simplest method of operating on the palpebral portion of the gland consists in making an incision along the external third of the orbital arch, and prolonging it a short distance beyond the palpebral commissure. 10th. In cases of incurable ectropium with profuse lachrymation, the extirpation of the two portions of the gland might be made at once by this same incision.

The Injurious Effect of Cocaine upon the Cornea.

Bunge reports (*Kl. Mon. f. Aug.*, Sept. 1885) a number of cases in which cocaine, which had been employed previous to operation, produced infiltration

and loss of substance in the cornea. The first case was a cataractous patient, in whom a four per cent. solution of cocaine had been energetically employed as a preliminary to operating. When the operator was about to begin, it was found that the cornea had suffered a loss of epithelium at its centre over a space $\frac{1}{4}$ of an inch in diameter, but had remained transparent. There were no signs of irritation in the eye. The operation was postponed, and the eye bandaged. In twenty-four hours the loss of epithelium had been repaired, and three days later the extraction was done without cocaine. A second case occurred in a woman, æt. 54. The same loss of epithelium occurred at the centre of the cornea after the energetic use of cocaine. The operation was postponed and the eye bandaged. In two days the cornea was again perfectly normal, and on the fourth day the operation of extraction was done without cocaine. Then come a series of seven cases in which cocaine was used as a preliminary to operation, in which there was no loss of epithelium before the operation, but in which, after the operation and antiseptic dressings, there occurred a parenchymatous infiltration of the cornea, and in one case a vesicular keratitis. The opacity seemed to start from the wound, and extended toward the lower margin of the cornea. The surface of the cornea seemed to be in places lifted up and in other places depressed.

Case of Cyst of the Ciliary Body.

Aub reports (*Amer. Journ. of Ophth.*, May–June, 1885) an interesting case of this rare disease, resulting from an injury. The patient was a man, æt. 27, who was cut over the forehead and right eye, with two gashes through the lid, one extending into the lower. The wounds were united and the eye bandaged. Aub saw the patient for the first time four months later. At the inner side of the cornea, about 3‴ from its margin, was a vertical scar 4‴ long, which was much thinned and decidedly depressed. Anterior to this scar the eye was staphylomatous. The cornea was clear, the anterior chamber free, the pupil oval and drawn toward the scar. The outer pupillary margin of the iris was adherent to the capsule. The lens was clear, except for some pigment deposits on the posterior capsule. Just behind the lens, and springing from the ciliary region, was an oval body extending halfway across the vitreous. The cyst-walls were transparent. V. $= \frac{9}{cc}$. After dilatation of the pupil, the cyst was found to originate at the centre of the scar, behind the suspensory ligament. It pushed the lens forward. The cyst gradually extended across the eye, and vision was eventually reduced to counting fingers at nine feet.

A Case of Chronic Glaucoma of Unusually Long Duration.

Priestley Smith records (*Ophth. Review*, September, 1885) a case in which the diagnosis of glaucoma was made nearly twenty years before operative treatment was undertaken. The patient was a lady, aged forty-five when first seen. An excess of tension was present at the beginning, and was well marked twenty years later, but was probably intermittent throughout. Very deep excavation of the disks coexisted with good sight, and only moderate contraction of the fields. Iridectomy gave an excellent result in each eye.

Throughout the long period of twenty years, there was probably an ever present tendency to increase of tension during periods of nervous exhaustion, and disturbance of the vasomotor system, to which the patient was peculiarly liable. The author thinks that the excavation of the disk in glaucoma is not a purely mechanical result of exalted pressure; it is, in part at least, an atrophic condition, which, though primarily due to pressure, includes vascular changes and impaired condition in the substance of the disk, which require a long time for their full development, and which may probably progress, even though all excess of pressure be removed.

After-treatment of Cases of Cataract Extraction.

Berry recommends (*Ophth. Review*, September, 1885) very careful antiseptic precautions. Before operation the conjunctival sac should be thoroughly washed out with a solution of corrosive sublimate (1:5000). The instruments should be cleaned in absolute alcohol, and then immediately afterward laid in a solution of carbolic acid (1:20); whence, before being used, they should be transferred to a saturated solution of boric acid. After frequently washing out the conjunctival sac, during and after the operation, with the sublimate solution, a piece of lint, dipped in the same solution, is applied over the closed lids, and on top of this a piece of gutta-percha tissue, and then a pad of cotton-wool, the whole being retained in position by means of a light flannel bandage. In cases where a chronic conjunctivitis or epiphora exists, a thick layer of finely powdered iodoform is applied directly to the wound in the eye before putting on the dressing. The dressing is changed after twenty-four hours, the eye examined, carefully bathed with the sublimate solution, and again dressed in the same way. If a good anterior chamber is found, the wet antiseptic dressing, which is renewed every twenty-four hours, is exchanged on the fourth day for a dry antiseptic one, which merely consists in a pad of fine absorbent cotton-wool, dipped in the sublimate solution, and allowed to dry on the eye. On the sixth or eighth day the bandage may be changed to a shade. Berry uses mydriatics only when there is a trace of iritis, and myotics only in the rare cases in which extraction is performed without iridectomy, and then only until the anterior chamber is reëstablished.

Positive Central Scotomata, and the Cause of Disturbance of Vision in Diseases of the Retina.

Treitel (*Archiv für Ophthal.*, xxxi. 1) distinguishes between scotomata of the retina and scotomata of the optic nerve. The first appear to the patient as dark spots, while the latter are only discovered by the physician after an examination of the field. These are known as negative, while the former are called positive. Positive scotomata are met with in retinal apoplexy, in hemorrhagic retinitis, and in retinitis albuminurica, in which symptomatic night-blindness does not occur. Positive scotomata are to be regarded as entoptic appearances. Here the transparency of the retina suffers. These positive scotomata are due to the shadow of these opacities, which is proved by the conditions under which the patients see the gray spot most distinctly, and also by testing the parallax of the shadow. The color-sense in these

cases suffers because the cones of the diseased part of the retina are covered. Here is the difference between anomalies of the visual sense occurring in disease of the retina, and similar anomalies occurring in disease of the optic nerve. The principal difference between diseases of the retina and diseases of the optic nerve does not lie in the loss of the color-sense, which is met with in both, but in the manner in which this loss occurs.

Abortion for the Albuminuric Retinitis of Pregnancy.

Howe has analyzed (*Amer. Journ. of Ophthal.*, May and June, 1885) all the published cases of this kind which he could find as far back as 1870, in order, if possible, to formulate some of the indications as to the time when interference may be necessary. This analysis tends to show that when the vision begins to be impaired only in the last two weeks of pregnancy, recovery follows almost invariably. Of those cases described as being in the eighth month, or thereabouts, when the retinitis began, not one-half recovered, and several did not materially improve. Finally, when the retinitis began earlier, and when nature did not interfere by bringing on a miscarriage, and when the patient escaped with her life, it was only to remain permanently blind. The time at which the retinitis appears, and its degree, are perhaps the more important factors in the problem, but next to these the quantity of albumen, and the relative time of its appearance, give an indication as to the probable result. Howe infers that the induction of premature labor is warranted when the retinitis appears in a comparatively early stage of pregnancy, and persists in spite of proper treatment; but is not warranted in the last few weeks of pregnancy, in spite of the greater ease with which it is accomplished, unless the inflammation is unusually severe.

A Case of Injury to the Eye from a Stroke of Lightning.

Laker reports (*Arch. of Ophthal.*, xiv. 2 and 3) a case of this rare injury in a soldier, aged twenty-three. A bolt of lightning passed through a window into the room where the soldier was, and he fell unconscious to the floor. When he regained his senses he was totally blind, and suffered for several hours from violent tonic and clonic spasms of the lower extremities. There was no external trace of injury on any portion of his body. He remained totally blind for a week, and then his vision began to return and improved for two weeks, since which it remained unchanged. R. E. V. $= \frac{6}{LX}$; L. E. $\frac{3}{LX}$. Both pupils were eccentric and oval, rather dilated and sluggish. There were no posterior synechiæ. The tension was normal. There were numerous punctate opacities in the anterior cortex of the right lens. The retinæ were hazy and brownish-red, and the outlines of the disks indistinct. The vessels had ill-defined contours, and were reduced in calibre. Both optic disks were discolored grayish. The macula in the right eye presented a round, bright red appearance, surrounded by a border of pigment. In the left eye the region of the macula showed a large, bright red, rhomboid spot, also surrounded with pigment. In the right eye there were also numerous, zigzag patches of pigment near the disk, beneath the vessels. In the right eye the

light-sense was reduced to one-quarter (photometer scale of 5 mm.), and in the left eye to $\frac{1}{15}$ (photometer scale of 15 mm.); color-sense was normal for both eyes. The presence of a central scotoma could not be detected, nor could the field of vision be tested, owing to the absence of a perimeter. The lightning-shock, no doubt, produced neuro-retinitis with retinal hemorrhages, alterations at the macula, and slight opacity of the lens, which remained unchanged for a period of six months.

Excessive Glandular Development in the Optic Disk in a Case of Atypical Retinitis Pigmentosa.

Remak relates (*Centralbl. für prakt. Augenheilk.*, Sept. 1885) a case of this kind occurring in a man, aged fifty-two, who had lost the *right* eye fifty years before, from an injury. This eye had never shown any signs of irritation, and was a marked example of phthisis bulbi. The sight of the *left* eye began to fail at the age of seven, and by the time he was fifteen he could no longer read. For a year he had only quantitative perception of light. On examination of the left eye there was found a senile cataract with thickened capsule and fluttering iris, and very uncertain projection. The lens in its capsule was extracted under cocaine, iridectomy having been previously performed; and the wound healed smoothly. The resultant vision was only equal to counting fingers at a distance of about twenty inches, and the reason for this was revealed by an ophthalmoscopic examination. There were cord-like opacities in the vitreous, and the papilla presented an appearance resembling a piece of large intestine; a conglomerate of five or six rounded and oval bodies of an intense bluish-white color, arranged in a curve with its convexity outward (inverted image) and its concavity inward. Their surface extended above the level of the retina, and showed a number of very small blood-vessels. The rest of the retina was entirely devoid of vessels, and scattered over the fundus were patches of deep black and brown pigment, while above and below the glandular development there was entire absence of the pigment epithelium.

Ophthalmometry with the Ophthalmometer of Javal and Schiötz.

Burnett recommends (*Arch. of Ophthal.*, xiv. 2 and 3) strongly the use of this instrument in determining errors of refraction. He considers it the most practical of all the instruments of precision which are employed in the diagnosis of astigmatism. The examinations can be made with great rapidity, as less time is consumed than even an expert would take in making the same determination with the ophthalmoscope. It is of most essential value in cases of astigmatism of high degree, and especially in mixed astigmatism. He thinks it will render valuable indications as to the kind of section likely to give a minimum of deformity in the corneal curvature, by making a number of accurate ophthalmometric measurements of eyes operated on for cataract by extraction. Another field for usefulness of the ophthalmometer will be in the selection of a place for making an iridectomy in cases of leucoma of the cornea, as the instrument will show at once which portion of the corneal surface is most nearly regular.

Contribution to the Knowledge of the Refractive Condition of the Eyes of Infants and Young Children.

German's investigations (*Arch. of Ophthal.*, xxxi. 2) are based upon an examination of the eyes of 110 children, from birth to three months old. He found that the eye of the nursing infant is strongly hypermetropic, but that the hypermetropia steadily diminishes with advancing age; in other words, that the eye gradually changes with its growth from a weaker to a stronger refraction. Hence the physiological refractive condition is that of the hypermetrope.

Congenital Complete Paralysis of the Muscles Supplied by the Motor Oculi Nerve, with the Exception of the Irides and Ciliary Muscles.

Tilley reports (*Amer. Journ. of Ophthal.*, Sept. 1885) a case of this kind in a boy, aged twelve, of normal mental and physical development, with no family history to account for the condition. The appearance, attitude, and gait of the patient were pathognomonic of the defect. The divergence of the axes of the eyeballs was so great, that double vision was absent throughout the extent of the visual fields. An examination of the vision showed: R. E., $\frac{6}{\text{XXXVI}}$; L. E., $\frac{6}{C}$, and no improvement by glasses. He could read Sn. 0.8 at 6 inches with either eye. The color-sense was normal. There was complete absence of the patellar tendon reflex. Tilley thought that the seat of the lesion was in the cerebral substance, a view somewhat strengthened in his mind by the diminution of visual acuity. It is difficult to understand, on this hypothesis, how the fibres supplying the irides and ciliary muscles should have escaped. It is possible that the abducens nerve may have supplied the motor fibres.

Tenotomy of the Inferior Oblique Muscle.

Landolt describes (*Arch. d'ophthal.*, Sept.–Oct. 1885) his method of operating for tenotomy of the inferior oblique as follows: After fixing the skin on a level with that part of the inferior orbital margin which corresponds to the insertion of the muscle, a short, deep incision is made through skin and orbicular muscle down to the inferior margin of the orbit. After arresting the hemorrhage by aseptic iced applications, the lips of the incision are separated by hooks, and the wound examined for the tendon of the muscle, which is recognized by its color and the oblique direction of its fibres. The muscle is then seized with forceps or by means of the strabotomy-hook, and divided with either scissors or bistoury. The wound is then closed by a single suture. The course and insertion of this muscle probably exert some influence in the production of a venous stasis in the uveal tract, for beneath it may be always found one of the vasa vorticosa. This is of some importance in connection with one of the theories as to the production of progressive myopia.

A Case of Periodic Paralysis of the Oculomotorius.

Manz (*Berl. klin. Woch.*, Oct. 5, 1885) prefaces a very detailed account of a case of this kind, occurring in his own practice, with a brief *résumé* of the

cases hitherto published by Weiss, Thomsen, Remak, and others. The case which he has himself so carefully described, occurred in a young man, age not given, who had complete paralysis of all the branches of the right third nerve, with vision in the right eye of $\frac{4}{VI}$ and a hypmetropia of D. 0.25; the left eye being normal in all its functions. There was very marked limitation of accommodation and a boring pain in the orbit behind the eye. He had suffered from right hemicrania or migraine from his earliest childhood, but the first occurrence of the paralysis was in his fourteenth year, following a severe attack of hemicrania. Since then the paralysis has occurred at intervals of four or six weeks, and was always preceded by the hemicrania, which grew less and gradually disappeared after the occurrence of the paralysis. The duration of the latter varied from a day to several weeks. There was never any disturbance in the other motor or sensory nerves. In the intervals of the paralysis there remained a somewhat dilated pupil and a slight divergence of the eye. The patient was otherwise perfectly healthy, and had always been so. Abuse of alcoholics always brought on the paralysis. The case in some respects resembled one of migraine, but, on closer examination, it will be seen that each attack was simply an exacerbation of an existing diseased condition, due either to a local extension of the focus of disease, or to an increase in the degree of paralysis from compression of the nerve-fibres. Accompanying the lesion there might be either a transient cerebral hyperæmia or cerebral anæmia. If the paralysis be of central origin, we must locate the lesion in that region of the brain in which the nuclei of origin of the branches of the third nerve are found, stretching from the third ventricle backward through the aqueduct of Sylvius; a so-called nuclear paralysis. If the paralysis be peripheral, we must search for the focus of disease somewhere in the nerve-trunk between its point of exit at the anterior border of the pons and its entrance into the wall of the cavernous sinus. The unilateral character points to a peripheral origin of the disease. Our knowledge of the anatomical changes in recurrent paralysis of the oculomotorius also points to a peripheral origin, a disease of the nerve-trunk itself. No positive opinion can be formed as to the location of the lesion in these cases, but an additional point in favor of the peripheral origin of the disease lies in the fact that no one has as yet furnished proof of the existence of an intracerebral lesion as the cause of an isolated paralysis of a single branch of the third nerve on one side.

A Case of Abscess of the Orbit; Total Blindness; Atrophy of the Disk and Obliteration of the Retinal Vessels, following an Unsuccessful Attempt to Extract the Upper Canine Tooth.

Burnett reports (*Arch. of Ophthal.*, xiv. 2 and 3) an interesting case of great swelling of the eyelids and face, following an unsuccessful attempt to extract the upper canine tooth, in a negro, aged 35. Burnett saw the case four months later, when the eye was in proper position and its motility perfect. There was a depression at the outer part of the lower orbital ridge, extending four-fifths of an inch downward into the cheek, caused by exfoliation of bone. There had undoubtedly been an abscess of the maxillary antrum, caused by a fracture of its walls from the forcible but unsuccessful

attempt to extract a tooth, which led to the inflammation in the orbit. Further evidence of this was the destruction of a part of the superior maxillary bone at the lower edge of the orbit.

Contribution to the Knowledge of the Retrobulbar Propagation of Choroidal Sarcomata, and to the Question of the Course of the Nerve-fibres in the Region of the Optic Nerves.

Jatzow's paper (*Arch. f. Ophthal.*, xxxi. 2) is a long and interesting contribution to our knowledge of a subject which is even now a moot point in the minds of some ophthalmologists. As a result of his examination of patients and his microscopical investigations of cases of choroidal sarcoma, it is his belief that in every case of tumor of the optic nerve and of choroidal tumor, a careful examination should be made of the field of vision of the sound eye. He is convinced that the existence of a defect in the temporal half of the field of vision, which has begun in the infero-temporal quadrant, is pathognomonic of an extension of the neoplasm from the optic nerve-fibres to the chiasm. He thinks that the uncrossed bundle of nerve-fibres occupies the lateral or outer half of the optic nerve immediately behind the chiasm. In his opinion, the fibres destined for the temporal half of the macula must occupy the temporal half of the optic nucleus, while the fibres destined for the inner half of the macula must occupy the inner half of the optic nucleus, and that the fibres destined for the outer and inner parts of the periphery of the retina must occupy the respectively corresponding parts of the transverse section of the optic nerve. The paper is a complex one, but will repay careful reading.

Microchemical Investigations into the Origin of the Pigment in the Melanotic Tumors of the Eye.

Vossius (*Arch. f. Ophthal.*, xxxi. 2) has undertaken to solve the question whether the pigment of melanotic tumors comes directly from the coloring matter of the red blood-corpuscles, or whether it is produced by a metabolic activity of the tumor-cells from the blood-plasma circulating in the tissue. He employed both Perls's and Quincke's method of investigation, and used also the method of coloring with eosine recommended by Merkel. The result of his investigations convinced him that the greater part at least of the pigment of melanotic sarcomata comes from the red blood-corpuscles.

Gouty Affections of the Eye.

Lychon (*Recueil d'ophthal.*, September, 1885) sums up his conclusions in regard to the effect of the gouty diathesis on the eye as follows: 1. Gout produces in the skin and conjunctiva of the eyelids a dry eczema, lithiasis, and a peculiar form of conjunctivitis. 2. It produces in the cornea a calcareous degeneration of the epithelium. 3. It causes simple and complex inflammation of the sclerotic. 4. It causes iritis and irido-choroiditis of a special character. 5. It has a marked tendency to produce hemorrhagic glaucoma. 6. It causes characteristic exudations in the retina. 7. It gives rise to sclerosis of the lens. 8. It gives rise to thrombosis of the intracranial and intraocular vessels, and consequent partial or total hemianopsia, or a more or less complete blindness.

OTOLOGY.

UNDER THE CHARGE OF
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The Acoustic Value of the Auricle.

In a case of traumatic defect of the auricle, in a man forty-six years old, Bürkner embraced the opportunity to test the acoustic function of the auricle (*Archiv für Ohrenheilkunde*, Bd. xxii. p. 201, Aug. 1885). He corroborated the observation of Kessel (*Ibid.*, Bd. xviii. p. 120), viz., that the auricle is of value in the perception of sound, so long as the latter does not fall upon the ear, in the direction of the axis of the external auditory canal. The part played by the auricle, in the perception of quality of sound, as set forth by Mach, C. H. Burnett, and Brown, the author could not test, as the patient possessed no musical sense. Bürkner, however, was able to determine that the auricle has power to aid in the detection of the direction of sound. How far the hearing in this case would have been modified by the loss of the tragus, which, according to Politzer and others, possesses a certain influence in hearing, was not determined. The case, however, was confirmatory of the view that the *auricle aids in the recognition of the direction of sound, and in the accurate perception of sound which does not fall directly upon the ear in the line of the axis of the auditory canal.*

The Comparative Results of Different Methods of Testing the Hearing.

Prof. Burckhardt-Merian, in a paper read at the Third International Otological Congress, Basle (*Archiv f. Ohrenheilk*, Bd. xxii. pp. 177–194), admits the existing want of a fixed test for the hearing, and is inclined to the views of Wolf, that the human voice is the best test at our command; but, in addition to the voice, he thinks we have other means of testing which should be employed in conjunction with the voice-tests.

According to his view, a perfect acoumeter should possess the following characteristics:

1. Exact power of determining the functions of the acoustic nerve, so that different observers in different countries can record the results in exactly the same manner.
2. The power to determine accurately the result of treatment.
3. Accuracy in deciding the position and the prognosis of the disease, from the result of the test of hearing.
4. Employment of the facts obtained from post-mortem examinations, and, hence, the ability to explain pathological discoveries, and aid in the perfecting of the physiology of the acoustic nerve.

"Such an instrument does not, and probably never will exist. In comparison with such, the finest musical instrument in existence is but a child's toy."

The author's mode of testing the hearing is as follows:

First. With Politzer's acoumeter, which has become with many aurists a substitute for the watch.

Secondly. The test with speech is carried out by whispered words at a maximum distance of six metres, which is considered the limit of normal hearing for words thus uttered.

Thirdly. A test is essayed by means of high notes, in which are employed König's rods, ut^7 or $c^5 = 8192$ vibrations a second, up to ut^{10} or $c^8 = 65{,}536$ v. s. By this means even the most unmusical person can be easily tested.

Finally. A test for the perception of Galton's pipes is made. These furnish notes of from 6461 to 84,000 simple vibrations per second. They have the good quality of being small and convenient, and of maintaining their notes quite a long time, which is not possessed by the König rods. Such a pipe knows no interval, so that lacunæ in the perception of notes can be detected.

It appears that the width of the auditory canal has no influence on hearing.

The results of Burckhardt-Merian's acoustic tests are as follows:

I. In a series of cases it is shown that in persons of all ages, affected in hearing, bone conduction is so powerful that the finest closure of both auditory canals cannot effect a weakening of perception of König's rods nor of Galton's pipes.

II. Generally (especially in children) a collection of cerumen does not reduce the hearing for the test-rods or Galton's pipes, yet the reverse is not unfrequently the case, so that with a collection of wax combined with deafness for high notes, it is impossible to make a conclusion as to a possible further affection of the auditory apparatus. In cases of obstruction of the ear by collections of cerumen, the perception of whispers is chiefly interfered with, while that for the acoumeter is less so.

III. Exudation in the tympanic cavity interferes in the greatest degree with the perception of whispering, and often also that of the acoumeter, but only in rare instances with the hearing of high notes, and then perhaps it is due to pressure upon the round window.

IV. Perforations in the membrana tympani, even when the malleus and anvil are destroyed, increase the perception of high tones, but disturb chiefly the hearing for whispers, less than for the acoumeter. Conversely there occurs, especially in the loss of the anvil, a delicacy of hearing for whispers, while loud words are heard with difficulty.

V. Excessive hydrostatic pressure in the labyrinth diminishes in the highest degree the perception of high tones, and also nullifies in general the hearing powers. If, however, in such cases the hearing remains normal, or not markedly diminished, it is to be referred to the regulation of the entotic pressure effected by the aqueducts.

VI. If with relatively normal hearing for whispers and the acoumeter, high notes are either not perceived, or only imperfectly so, it indicates an affection of the cochlea. Thus, after exposure to explosions, discharge of firearms, loud locomotive whistles, etc., in addition to feeling uncomfortable in the ear, it is found that those thus exposed do not perceive accurately high notes, while they continue to hear normally both the acoumeter or watch and whispered words. It is entirely justifiable, in the author's opinion, to refer the lesion in such cases to the cochlea.

VII. Adhesive processes, which diminish or greatly reduce the perception of whispered words, also impair the hearing for high notes. In such cases the note G^6 Sol^8 constitutes the highest limit.

VIII. When in those who are very hard of hearing an abnormally acute hearing for high notes can be detected, while speech conveyed to them by means of the hearing trumpet is not well understood, there is every probability that the case is one of anchylosis of the stapes.

IX. An equal reduction of hearing for the acoumeter, whispers, metallic rods, and Galton's pipes, may be considered an evidence of disease of the internal ear.

X. Relatively good perception for high notes with simultaneous deafness for low notes, sometimes accompanies the most intense forms of deafness.

XI. Galton's pipes are indispensable in the discovery of lacunæ in the scale of perception of notes.

XII. Deaf-mutes and very deaf subjects may still retain relatively good hearing for high notes.

The Action of Cocaine in Ear Diseases.

Dr. F. Kretschmann, of Halle (*Archiv für Ohrenheilk.*, Bd. xxii. p. 243), Kirchner (*Deutsche med. Wochenschrift*), Zaufal (*Præger med. Wochenschrift*, No. 7, 1885), Dr. A. G. Hobbs, of Atlanta, Ga. (*Archives of Otol.*, vol. 14, p. 109), and Dr. C. H. Burnett (*Trans. Amer. Otol. Soc.*, July, 1885) have given testimony as to the negative results with cocaine in its local action in painful diseases of the ear.

Kretschmann employed in all his cases a five per cent. solution of the hydrochlorate. The application was effected either by instillation or by soaking cotton and passing the latter down the auditory canal upon the membrana tympani, or upon a point chosen for incision. The period allowed for the application to take effect was not less than fifteen minutes, nor more than twenty minutes. In affections of the nares and nasopharynx, the application was made by the camel's-hair brush directly to the spot to be anæsthetized, and the operation repeated, if necessary, every five minutes. The conclusions are as follows:

1. In operations on the membrana tympani, the anæsthetic action of cocaine (five per cent. solution) is uncertain.

2. In operations on the tympanic mucous membrane, cocaine has an anæsthetic effect. It fails, however, if the cut be deep enough to involve the subjacent bone.

3. In operations on the nasal mucous membrane, cocaine has both an anæsthetic effect and one which abrogates reflex susceptibility.

4. In rhinoscopy, cocaine allays gagging and relaxes the soft palate.

Kirchner began his observations with a two per cent. solution, but found that nothing weaker than a twenty per cent. solution was sufficient to produce anæsthesia of the membrana tympani. But, even with this strong solution, the result is by no means certain, an experience similar to that of Zaufal, who has had negative results in producing anæsthesia of the membrana tympani with solutions of cocaine. But he finds that, in large perforations of the membrana, the mucous membrane can be reached and anæsthetized by cocaine, so that granulations can be removed without pain.

Dr. A. G. Hobbs, of Atlanta, Ga., adds further testimony to the uselessness of the local application of hydrochlorate of cocaine, except to mucous membranes. He claims to have relieved the pain of otitis media acuta, in several instances, by forcing a few drops of a two per cent. solution, and later of a four per cent. solution through the Eustachian catheter into the Eustachian tube, and also that in one case the treatment seemed to dispel a tinnitus which had existed for some time. But he seems to have lost sight of the fact that catheterization of the tube and inflation alone will often relieve pain in the ear, and also tinnitus. Unfortunately, writers on new subjects often prove too much, and thereby lead others, of even less experience than themselves, to undertake procedures in treatment in no way warranted by the experience of more skilful surgeons.

The Local Use of Brucine in Painful Affections of the Ear.

In this connection attention is called to the anæsthetic effects of brucine in ear diseases, as first announced by Dr. C. H. Burnett, in a paper read at the meeting of the American Otological Society, July 12, 1885, in which he reported a negative experience with the use of cocaine as an anæsthetic in the ear, but very good results from applying *five per cent. solutions of brucine to the ear*. Its local application as an anæsthetic to the ear was tried in the Philadelphia Polyclinic, at the suggestion of Dr. Thomas J. Mays. The solution employed was five per cent. of brucine, to which hydrochloric acid had been added in the proportion of five drops to the gramme, and in all the cases treated with this solution of brucine, the relief to pain has been prompt and complete, a result far more satisfactory than any obtained by using cocaine solutions in the ear. The applications to the ear were made by means of cotton, soaked with brucine solution, and mopped over the fundus of the canal (*Transactions of American Otological Society*, 1885).

Disease of the Labyrinth Complicating Scarlatinal Diphtheritis.

Dr. Oscar Wolf, of Frankfort-on-the-Main, reports (*Archives of Otology*, vol. xiv. pp. 137–157, Sept. 1855) three cases of special value, because there are very few, if any, instances of severe scarlatinous otitis accompanied by severe disease in the labyrinth, in which the course of the disease has been watched from the beginning by an aurist.

In the first case the diphtheritic process extended to the middle ear by the Eustachian tubes, and complete and permanent loss of hearing then ensued. The patient was a boy six and a half years old. The membrana tympani was swollen and infiltrated. Subcutaneous injections of pilocarpin were suggested, but were declined by the father of the patient.

The second case is of greater interest, because pilocarpin injections were used with apparent advantage. It was a case of "severe scarlet fever with diphtheria of the post-nasal pharynx and an extension of the diphtheritic process, *per tubam*, to both tympanic cavities." The patient was a girl seven years old, of healthy parents. The case was severe from the outset, the eruption becoming confluent in a number of places, and dark red in color. The pharynx was coated with diphtheritic membrane, and the cervical glands became swollen. The temperature ranged between 104° and 106½° F. for

eight days. The prostration was great. Salicylic acid was the drug given chiefly. The mucous membrane of the tympanic cavity was brownish-red, swollen, and spotted with yellowish membrane.

The treatment to combat the symptoms of labyrinth disease was begun by injecting 0.005 grm.—*i. e.*, $\frac{1}{15}$th of a grain—under the skin of the neck, twice daily, increasing the dose $\frac{1}{64}$th of a grain every two days, until the maximum, $\frac{1}{4}$th of a grain, was reached. A few minutes after each subcutaneous injection a half wineglass of sherry was given. In addition to this, a solution of boracic acid and a two per cent. solution of carbolic acid were used alternately to syringe the ear, and the mastoids were painted with tincture of iodine twice daily and the air douche was used once daily. The physiological effect of the pilocarpin was complete, profuse sweating and salivation following each injection. An increased secretion was also observed to come from the ears, accompanying the profuse sweating and salivation. In the course of six days sounds began to be perceived by the patient; high notes first, and then lower ones. In ten days sounds like the loud singing of a bird, became painful to the patient. This should be taken as a hint to be very careful in testing the hearing in those suffering from disease of the labyrinth. In five days from this time the patient appeared to understand single words. His head became freer, and subjective sounds were no longer complained of. In five days later only $\frac{1}{8}$th of a grain of pilocarpin was injected every two days. Up to this time thirty injections had been made in fifteen days, and the hearing was so much improved that the watch could be heard in contact, and conversation at two yards. The left ear remained very imperfect in hearing.

Vertigo and intense trembling, with inability to hold up the head, were marked in the beginning of this case, but after six or eight injections of pilocarpin the child could sit erect. At the time of leaving its bed, seven weeks from the beginning of the disease, the waddling gait was very evident and there was also a tendency to fall forward and toward the left. The waddling gait and the subjective sounds continued eight months.

Ten days later—*i. e.*, on January 30—another change was made in the injections of pilocarpin, viz., from this date to February 17, nine injections were made, when they were entirely discontinued. Under boric acid insufflations the discharge in the right ear ceased on February 22. The left ear remained diseased longer than the right ear and never recovered hearing to the same extent. By April 1st loud conversation could be heard at two yards, in the left ear, but whispers could be heard by the right ear at four yards. In the fall of the same year, the child returned to school and made good progress in her studies, her hearing being good, and all noises in the ear having ceased.

The third case is one of scarlatina and diphtheria, with parotitis on both sides. The patient, a little girl, four years old, in good health previously, was attacked with scarlatina on December 15, 1884. On the fourth day the temperature rose from 103.3° to 104.3° F., and diphtheritic membrane appeared in the nasopharynx, from which it advanced to the arches of the palate. On the sixth day there was considerable impairment in hearing, which constituted the first aural symptom. On the eighth day, anasarca of both eyelids, hands, and feet appeared. Urine light colored, copious, but without albumen. Diphtheritic masses still were syringed from the ears, and over the left mastoid there appeared a painful swelling. The patient still appeared to understand

loud speech. On the next day $\frac{1}{15}$th of a grain of the muriate of pilocarpin was injected under the skin of the neck. Two hours later there was moderate perspiration, but great depression and restlessness. This treatment was not repeated the next day, on account of the patient's weak condition. Twenty-two days later ringing in ears was complained of, and ten days later, in attempting to walk, the child complained of dizziness. The next day a second attempt to walk was made, and there was noted a tendency to fall toward the right side.

From the evidence of disturbance in the sound-perceiving apparatus (internal ear), it was decided to resume the use of pilocarpin. Twenty-six injections of pilocarpin were given in the course of two months, and the understanding for speech increased considerably. The general condition of the child by this time was very good.

Treatment of Chronic Catarrh of the Middle Ear.

At the recent meeting of the American Otological Society, the subject which excited the most interest, if we may judge by the discussion elicited, was chronic catarrh of the middle ear. The papers read by Drs. W. W. Seely, of Cincinnati, and Charles H. Burnett, of Philadelphia, showed that the great number of cases of deafness caused by chronic catarrh of the middle ear, associated with chronic rhinitis, render this form of aural disease of chief importance to aurists, and they also showed that there can be no rational, and, hence, hopeful, treatment of these cases, without the most judicious treatment of the nasopharynx.

The old-fashioned, perfunctory examination of the membrane, and of the throat, during a visit to the family doctor, or to some specialist, without examination of the nares, the old statement that the drums are thick and the throat "relaxed," or some placebo-statement, will not now suffice. These cases of deafness are not caused by faucial disease, though this part of the air-passages may be affected simultaneously. The posterior nares, the nasopharynx, the anterior nares, and the turbinated bones, are the seat of the original and causative disease, and hence demand the strictest attention of any one treating ear diseases.

As declared by the writer of the first paper, "these cases require a vast amount of time, care, and patience." Most of them are, at last, amenable to treatment, but it is impossible to say in any given instance, at the outset, how long a time will be required to produce beneficial results with the treatment. It is not possible to base a prognosis on hearing-tests, bone-conduction, etc., and, therefore, no case should be dismissed from treatment without, as Dr. Seely aptly terms it, the "test by trial"—*i. e.*, by treatment.

The second paper regards all cases of so-called chronic aural catarrh as rhino-aural affections, falling into one of two classes, viz., the hypertrophic or the atrophic, chiefly into the former. The treatment, of course, differs greatly for the two forms—and it is because this difference has not been recognized, and treatment when applied to the nares and nasopharynx has been too often of a routine and perfunctory nature, that frequently more harm than good has occurred to the nares and the middle ears. In the hypertrophic form the treatment must be much gentler, of a mildly astringent quality, rather than

a stimulant form, which is adapted to the atrophic forms of rhinitis and rhino-aural disease. It was also shown that the appearances of the membrana tympani are so variable in the hypertrophic form that nothing can be predicated of the tympanic disease by simple inspection of the membrana. In the atrophic form of chronic aural catarrh, the appearances of the membrana being more consistent and invariable, the surgeon can predicate more of the tympanic disease, from simple inspection of the membrana, viz., that it is sclerotic in form. From this variability in the appearances of the membrana, in the hypertrophied form of aural catarrh, it follows that changes in the membrana, taken alone, are of little moment respecting the hearing. The lesions most competent to induce acoustic disturbances are apt to be situate upon the ossicula or upon the inner tympanic wall near the fenestræ.

It was, furthermore, urged that the aural surgeon must inspect the nares, and treat the various forms of nasal catarrh as they occur in chronic catarrh of the middle ear, laying much more stress upon the condition of the nares and nasopharynx than upon that of the fauces, so far as any casual relation between the latter and the deafness is concerned. Both papers enjoin the importance of great caution in the treatment of the nares, and the careful avoidance of overstimulation of these parts. Too often inflammation of the middle ears, and an increase of deafness, follow the injudicious treatment of the nares. Hence, the nasal douche, the post-nasal syringe, and snuffing of medicaments by the patients, are positively interdicted. It is also hazardous to entrust any form of inflation by the Eustachian catheter to the patient.

A word of caution is also given in the second paper regarding the use of the galvanocautery or any other severe means of removal of hypertrophies from the turbinated mucous membrane, or any other form of nasal obstruction. The cautery, like the nasal douche, is certainly open to the criticism that in some cases it excites inflammation of the nasopharynx, the faucial end of the Eustachian tube, and middle ear. The writer has seen several cases in which the operation on the nares excited acute inflammation in the middle ear. In two instances suppuration of the inner cavity and perforation of the membrana ensued, while in one instance a severe catarrhal swelling of the tube and deafness were the result.

Chief reliance is placed by the writer of the first paper upon emollient or mildly stimulating salves, and unguents applied to the nares, with the judicious use of the Eustachian catheter or inflation bag.

According to the writer of the second paper, good results are obtainable by the employment of spray carefully applied to the nasopharynx by the way of the anterior nares, and, in cases of acute congestion, by anodyne powders. In the hypertrophic form of naso-aural catarrh the treatment should be cleansing, astringent, emollient; while in the atrophic form it should be cleansing and stimulant. It may be set down as axiomatic that in the hypertrophic form *no* kind of nitrate of silver application is tolerated in the nares.

The throat symptoms can be combated by suitable gargles and sprays, or by direct application of preparations of tannin, chloride of iron, and iodine, made by the caustic holder directly to the diseased spots, under illumination from the forehead mirror, and not by indiscriminate swabbing, which is as injurious as it is unskilful.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,

PROFESSOR OF DISEASES OF THE THROAT AND CHEST, PHILADELPHIA POLYCLINIC.

Rhinoscleroma a Parasitic Disease.

MM. Cornil and Alvarez (*Annales de Derm. et de Syph.*, vol. vi., No. 4) describe a microbe which they have found in preparations from five cases of rhinoscleroma. The rods are always surrounded by a capsule which may contain one, two, or a group of four or five bacilli. These encapsulated rods, which are 2½ μ. to 3 μ. long and 0.4 μ. to 0.5 μ. broad, contain colored granules resembling spores. They are found free in the tissues, between the reticular fibrillæ, around the large cells, in the interfibrillary spaces, or in the lymphatic vessels. The authors consider the presumption to be strong that rhinoscleroma is a parasitic disease.

Acute Coryza a Mycotic Disease.

Dr. Austin Flint, Sr., (*Medical News*, October 24, 1885) favors the view that acute coryza is a mycotic disease, differing from influenza only in degree. This is an extension of Prof. Flint's recent assault upon the "taking cold" theory in general. Nevertheless, the effects of "cold" in exciting inflammations in various organs, or at least predisposing to such inflammations, are too well recognized to become a matter for doubt.

Treatment of Acute Coryza.—Several journals contain, copied from one another and variously credited, "a certain means of relieving the discomfort incident to a cold." It consists (Dobson, *Lancet*, May 31, 1884) in pouring half a pint of boiling water over a drachm of pulverized camphor and inhaling the vapors for ten or fifteen minutes. Dry camphor vapor, *a la cigarette*, suggested by the notorious Raspail, has long been in good repute.

Dr. Solomon Solis-Cohen (*Medical Times*, Philadelphia, August 8, 1885) reports good results from atropine at the commencement of the attack (gr. $\frac{1}{150}$ repeated in four hours), and from ammonium salicylate (gr. x–xv every two hours until tinnitus aurium is produced) when the case has so far progressed that good results from atropine are not to be expected. Cinchonidine salicylate is recommended for influenza. For local application, erythroxyline hydrochlorate (suggested by Bosworth) and infusion of erythroxylon are advised.

Etiology, Pathology, and Histology of Chronic Inflammations of the Nose and Nasopharynx.

Dr. John N. Mackenzie (*Medical News*, April 4, 1885; *New York Med. Journ.*, August 22, 1885) contributes the results of pathological studies upon acute and chronic inflammations of the nasal mucous membrane. In the

former communication he suggests the following classification by stages: I. Simple inflammatory rhinitis. *a*. Irritability of erectile tissue. *β*. Permanent dilatation of erectile tissue. II. Hypertrophic rhinitis. *a*. Dilatation with hypertrophy. *β*. Complete hypertrophy. III. Atrophic rhinitis. *a*. Commencing atrophy. *β*. Complete atrophy.

In the latter article, a microscopical section through the inferior turbinated bone of a man dead of Bright's disease, the result of long-standing mitral insufficiency, is presented as the probable picture of the histological changes in acute coryza. Another section illustrates dilatation with hypertrophy in chronic nasal inflammation. Dr. Mackenzie recognizes four modes by which the erectile spaces become obliterated in nasal inflammation. 1. By the contraction of newly formed intercellular fibrous bands. 2. By obliteration of their lumen by masses of lymphoid cells. 3. By the formation of thrombi. 4. By the process of septa formation. The author refers to the interdependence of chronic nasal and chronic antral inflammation, and the rarity of secondary involvement of the antrum.

The same writer (*New York Medical Journal*, September 12, 1885) refuses to "ascribe all diseases to the peripatetic excursions of a vagrant micrococcus;" nor does he consider dust the prominent factor that it is sometimes alleged to be in the localization of inflammatory disease in the nasopharynx. Variable climatic conditions, and defective assimilation from whatever cause, whether hereditary or acquired taint, or indiscretions or excesses of any kind, seem the principal exciting and predisposing causes of simple inflammations of the upper respiratory tract.

Treatment of Chronic Coryza.

At the meeting of the American Laryngological Association, June, 1885, prominence was given in debate to the use of mild measures, such as persistent dilatation of the obstructed nasal passages by means of compressed tubes of laminaria, with efficient cleansing by means of slightly aromatized alkaline sprays; supplemented by great attention toward keeping the various emunctories in marked activity, and such general hygienic and dietetic regulations and constitutional medication as the individuality of the case might demand. —*Med. News*, July 4, 1885.

Ozæna.

Dr. E. J. Moure (*Soc. franc. de Laryngol.*, April, 1885; *Annales des mal., de l'oreille, etc.*, September, 1885) does not admit the incurability of ozæna. He proposes the use of the nasal douche with solutions of sodium bicarbonate, chlorate, or chloride, to soften and detach the crusts, followed by antiseptic irrigations, and insufflation of astringent powders; with constitutional medication by cod-liver oil or potassium iodide, the use of the Pyrennean thermal waters, and sojourn at the seashore.

Dr. S. Solis-Cohen, in a communication to the American Laryngological Association (*Annales des Maladies de l'oreille, du larynx*, etc., Sept. 1885), considers solution of hydrogen dioxide (10 vol., diluted, if necessary, with one or two parts of distilled and aromatized water) the best detergent and disinfec-

tant in fetid coryza; and ascribes to it a certain power in stimulating the reproduction of healthy epithelium. Ethyl iodide, by inhalation, was also favorably mentioned.

Tamponing the Nares; Hemorrhage.

For guiding the tampon, the compiler has for more than two years used simply a slender, flexible copper wire, headed at one end like a pin. The other extremity is turned up, at will, into a loop to which is attached the thread. The contrivance is passed in through the nostril and out through the mouth, and then cut from the thread, which now presents a free end at nose and mouth. Then the tampon is attached and pulled backward in the usual manner. Quite recently he has learned that, for the same purpose, the Japanese employ a spill made of a roll of narrow paper. A piece of bell wire can be utilized in an emergency. The copper wire, as above, answers admirably as a cotton-holder. It bends readily at any movement of the patient, and is thus rendered harmless. Small sections of wire can be mounted on holders and handles.

Cartilaginous Thickening, with Deviation of the Nasal Septum; Successful Operation.

Dr. Beverly Robinson (*Med. Record*, N. Y., 1885, also private communication) reports a case of thickening of the cartilaginous septum with deviation, completely occluding the right nasal passage, but allowing a little air to pass through the left side on great exertion. Gradually increasing difficulty in nasal respiration, with anosmia, inability to sleep or eat with comfort, and secondary bronchitic asthma, had followed a blow on the nose four years previously. For five months the patient had been unable to close her mouth day or night. The thickened tissues were removed from the right side by means of Weir's gouge forceps, and, later on, soft metallic bougies were passed daily for twelve days. At one time, exuberant granulations were repressed by chloride of iron. At another, applications of monochloracetic acid were made in both nasal passages. Complete relief from all annoying symptoms was afforded.

Hysterical Sneezing.

Charcot (reported in *Brit. Med. Journ.*, July 25, 1885) showed at his clinic a girl aged sixteen, of a well-marked neurotic tendency, with hemianæsthesia on the left side, and hysterogenic zones in the right breast and in the left ovarian region, who is subject to attacks of paroxysmal sneezing. The fits are preceded by a feeling of globus hystericus, and consist in nervous cough, laughter, and spasmodic sneezing, sometimes also yawning. Opisthotonos frequently occurs. The patient sneezes from thirty to forty times a minute. There is no hypersecretion from the mucous membrane of the nose.

Hay Fever.

This subject, of perennial interest, has this year been more than usually prominent in professional circles. The observations of Daly, Roe, Allen,

Sajous, J. N. Mackenzie, in America, and Hack, in Germany, had concentrated upon local pathological conditions and local surgery. More recent observations have directed attention to erythroxyline (cocaine) as an efficient local palliative medicament. BOSWORTH (*Medical Record*, Nov. 11, 1884) shrewdly inferred the value of this drug from his observations of its control over turgescence of the nasal mucous membrane. DA COSTA (*Medical News*, December 13, 1884) announced similar views from theoretical considerations. SOLOMON SOLIS-COHEN reported (*New York Med. Journ.*, Feb. 28, 1885) to the January meeting of the Philadelphia Laryngological Association its power to prevent typical paroxysms, which were produced in a pronounced hay fever subject by titillation of the unanæsthetized nasal mucous membrane. MORELL MACKENZIE predicted probable benefit from its use in his recent monograph on hay fever (London, May, 1885). Experience during the season just passed has verified the correctness of these inferences, as evinced by communications in the journals of the two continents, too numerous for detailed notice.

The experience of DA COSTA (*Med. News*, Nov. 7, 1885), and others, that in severe cases the asthmato-bronchitic manifestations are often unrelieved, or but slightly modified, despite the allaying of pruritus, the reduction of intranasal intumescence and consequent relief to coryza, tallies with that of the compiler. This fact may be collated with an observation by SAJOUS (*Hay Fever and its Successful Treatment*, Philadelphia, 1885), that the special location for nasobronchial reflexes is limited to the posterior portion of the lower turbinated body (the sensitive area first announced by J. N. MACKENZIE in its relation to cough). This is a locality least accessible to the drug, when used by application through the nostril. Should direct medication to that tissue succeed in controlling the asthma, Sajous's views will be confirmed. In the compiler's experience, the best method for self-application is to apply a solution from a dropper directly upon the surface of the lower turbinated body, or to place against it a saturated wad, held in position for a few minutes by compressing the nostril. Tablets he has found far less efficacious, and sometimes actually irritating. A solution of less strength than four per cent. is rarely satisfactory, and one as high as twenty per cent. may be necessary. Some patients prefer to carry about with them solutions of various strength, to be selected according to the indications of the moment.

Cocaine has some drawbacks. Apart from the familiar local benumbing effects, there sometimes results, as mentioned by BEVERLY ROBINSON (*Med. Record*, Oct. 17, 1885), a secondary occlusion, attributed by this observer to paralysis of the turbinated structures. S. S. COHEN (*loc. cit.*) reported a mild coryza following its use, and has seen its contact with the nasopharyngeal membrane actually provoke paroxysms of asthma, an experience shared by the compiler. Unpleasant constitutional symptoms, among them nausea, headache, giddiness, inability to concentrate thought, and even syncope, have been noted and must be considered as indications for temporary withdrawal of the remedy.

Other methods of treatment remain to be considered. ROBINSON (*loc. cit.*) speaks highly of local application of carbolic acid (one part of the acid to three parts of glycerine).

The electric cautery, whether to remove redundant tissue (Daly and Allen),

to destroy sensitive nerve endings (Roe), or to produce "superficial organic alteration of the nasal mucous membrane" (Sajous), is still ardently advocated as a means of radical cure. That incurable, offending pathological tissues should be removed, whether by forceps, acids, cold or heated wire, or incandescent blade, is conceded. That destruction of all tumefiable tissues will effectually preclude occlusion by tumefaction, is self-evident. Destruction, however, is not cure, and the production of unnecessary cicatrices may prepare the ground for less benign disease in the future. While instances of permanent relief by these methods are sufficiently numerous, the fact cannot be ignored that cases of reported cure are sometimes compelled to seek treatment for recurrence. The choice between reliance upon a satisfactory palliative or resort to operative interference in the chance of permanent relief must be settled between patient and physician.

Reflex Neuroses and Sequelæ.

A great mass of literature is accumulating upon this topic. While some contributions are of real value, many are apparently hasty and ill-considered.

Dr. Julius Sommerbrodt, of Breslau (*Berliner klin. Wochenschr.*, 1885, No. 11), states that of 138 cases in which he had occasion to produce galvanocaustic destruction of hyperplastic nasal mucous membrane, 8 only were conscious of nasal disease. 20 were cases of vasodilator neurosis of the bronchial mucous membrane without asthma. In the severest case, the slightest probing of the terminal extremities of the swollen lower turbinated body of the right fossa excited a painful tickling beneath the sternum, and a paroxysmal spasmodic cough and gagging lasting for half a minute, or a minute, and then suddenly ceasing. The case was cured by electrocauterization. Other affections, proceeding from a similar cause, include laryngismus, migraine, asthma (52 cases, only 4 of which had nasal polypi; 2 typical cases of hay asthma unrelieved despite energetic cauterizations), pharyngeal hyperæsthesia, spasmodic sneezing, nasal cough, trigeminal and supraorbital neuralgia. Most of these cases were relieved by electric cauterization under cocaine anæsthesia.

Dr. Fincke (*Moniteur de la Policlinique*, June 7, 1885) reports sudden, numerous, and repeated attacks of epileptiform convulsions in an individual sixty-four years of age, whose right nasal fossa was obstructed by a racemose group of polypi. Removal of the neoplasms cured the epilepsy, and the patient has remained well for two years.

Membranous Occlusion of the Posterior Nares, with Operations by the Galvanocautery.

Dr. W. E. Casselberry, of Chicago (*Journ. Am. Med. Assoc.*, Aug. 8, 1885, p. 148), reports an interesting case, occurring in a man of forty, a native of Russian Poland. Symptoms of obstruction of the left nasal passage had been complained of for thirteen years, with left-sided deafness and tinnitus aurium. Rhinoscopic examination showed the left choana to be covered almost completely by a tense membrane, approaching so closely to the septum that but a very narrow chink was left. The left Eustachian orifice was hidden from view. On the right, a similar membrane intercepted the view of the superior

turbinated body, the outer half of the middle turbinated body, and the Eustachian orifice. After preliminary training, the membranes were divided by a galvanocaustic knife introduced through the mouth, under rhinoscopic guidance. Three operations cleared the left side from all obstruction; and four were necessary upon the right.

The author gives a *résumé* of the literature of atresia narium. He considers the malformation in his case to have been congenital.

Osseous Occlusion of the Choanæ.

Schrötter, of Vienna (*Monatss. f. Ohrenh.*, etc., No. 4, 1885) describes a case in a female nineteen years of age, and presents a reference to nearly all other reported cases. His own case was bilateral. It was treated by boring through with an electric cautery and chiselling off the lateral edges.

Primary Malign Tumors of the Nose.

Dr. E. Schmiegelow, of Copenhagen, contributes to the *Revue Mensuelle de Laryngologie* (August and September, 1885) a valuable paper on this subject. He reports two cases of lupoid polypi (polypes lupeux), one of carcinoma and one of sarcoma. Operative measures (cold wire, electro- and chemical cauterization) were successful in each instance. The questions of diagnosis and prognosis are treated of at some length, and a number of important points are brought forward. The cases of lupoid polypi are compared by the author to the well-known tuberculous granulomata of the larynx, to which attention has recently been called by J. N. Mackenzie, Kidd, Schnitzler, and others; and the general analogy between lupus and local tuberculosis is accepted as indicating the identity of the affections.

Osteoma of Nasopharynx.

Dr. Theo. Stanley (*Med. and Surg. Reporter*, May 9, 1885) reports a unique operation by Prof. Garretson. The patient, a lady of fifty-five, had been troubled for eight years with gradually increasing occlusion of the posterior nares, until, finally, nasal respiration had become impossible. Diagnosis of an osseous tumor, springing from the base of the sphenoid bone, was made after palpation with a probe passed along the floor of the nose from in front, and with the finger passed behind the velum. The nasopharyngeal space was greatly encroached upon.

The patient being etherized, a buttonhole incision was made through the soft palate, and the overlying soft tissues were separated from the bony mass by means of a delicate chisel, curved on the flat, an incision having been previously made the whole length of the tumor. The osteoma and the body of the sphenoid bone were then drilled away by means of a burr attached to the surgical engine, "the only part of the body of the bone left being the half-cut-away shell of the pituitary fossa." The patient made a good recovery in fifteen days. This is a remarkable operation, and one that would have been impossible before the invention of the surgical engine.

Pharyngeal Bursa.

Dr. G. L. Tornwaldt, of Danzig (*Ueber die Bedeutung der Bursa Pharyngea*, etc., Wiesbaden, 1885), calls attention to the importance of this structure in

chronic diseases of the vault of the pharynx. He reports twenty-five cases of disease of the bursa, most of them cystic. The treatment consists of destruction of the cyst, chiefly by electric cautery.

Hard Chancre of the Tonsil.

Dr. Frank Donaldson, Jr., (*Med. News*, Aug. 15, 1885) reports a case, occurring in a prostitute, æt. twenty-nine. The lesion occupied the left tonsil, as a ragged, pultaceous ulcer, grayish-white, and not deeply excavated. The tonsil itself was somewhat enlarged. There was glandular enlargement on the left side. A hard chancre of the upper lip coexisted. The author reviews the literature of the subject, and gives in tabulated form the differential diagnosis between syphilitic ulcerations of the tonsil and epithelioma.

Fumigation in Croup and Diphtheria.

Fumigations from a five per cent. solution of phenic acid in glycerine, a teaspoonful at a time, is said to have been successfully used in croup at the hands of Dr. Aumaitre (*Gaz. Méd. de Nantes*, No. 8). The compiler has long used nebulized solutions of carbolic acid, with great satisfaction.

Dr. Delthil, of Paris, who has for some time advocated the treatment of croup and diphtheria by fumigations with vapors produced by the combustion of a mixture of coal-tar and turpentine, gives in the *Journ. de Méd. de Paris* (*Med. News*, Aug. 18, 1885) further details of the treatment. If necessary, tracheotomy is also to be performed. The compiler has seen false membrane rapidly break down under this treatment, as claimed by the author. The dirtiness of it, however, is a serious objection. Dr. Major, of Montreal, has constructed an ingenious apparatus which, to some degree, obviates this objection.

Solvents of Pseudo-membrane.

Papayotin, first recommended by Rossbach (*Berliner klin. Woch.*, 1881, No. 10) as a solvent for pseudo-membrane, and subsequently by many other observers, has recently been subjected to a severe test by Dr. V. J. Drerer, of Moscow (*Vratch*, 1885, p. 15, *London Med. Record*, Aug. 15, 1885), who painted the parts every fifteen minutes during the daytime in thirty-one cases, using a five per cent. solution in water, with a two per cent. solution of sodium bicarbonate. The average duration of treatment was between two and three days; the mortality, sixty-two per cent. His conclusions are: 1. Papayotin produces a slight solvent action on diphtheritic membranes in the stage of their regressive evolutions; 2. Soft freshly originating membranes do not yield to the action of the drug; 3. Papayotin has no influence on the mortality and general symptoms in diphtheria. This is in marked contrast with the reports by Schäfer (*Berlin. klin. Woch.*, 1883, No. 52) of a mortality of less than four per cent. out of forty-seven cases. H. Kriege (*Jahrb. f. Kindh.*, xxiii., 1 u. 2, 1885) reports good results in fifty-eight cases. L. Stumpf (*Deutsch. Archiv. f. klin. Med.*, Bd. 36, H. 5 u. 6) doubts its utility. Rossbach (*Idem.*, Feb. 19, 1885) repeats his good opinion, and lays stress upon the importance of obtaining a good preparation, as many of the preparations are worthless.

Treatment of Tuberculosis of the Larynx.

Dr. H. Krause (*Berliner klin. Woch.*, July 21st) reports benefits so remarkable from local applications of concentrated solution of lactic acid (25 per cent. to 80 per cent.) as to lead him to indulge in hopes of its curative powers in the least unfavorable class of cases. It has to be applied rather roughly, and acts by production of slough, sometimes producing severe immediate effects. Ultimately, healthy granulations repair the ulcer and papillary excrescences disappear, swellings and infiltration subside, and the general subjective condition is much improved.

Internal Œsophagotomy for Stricture of the Œsophagus.

Dr. Sands, of New York, reports (*N. Y. Med. Journ.*, Nov. 14, 1885) a case of stricture, of nineteen years' standing, from caustic potash swallowed at two years of age, which he had treated successfully by this method, and which exemplified the incorrectness of the common impression that all strictures of the œsophagus exhibit an invincible tendency to recontraction after operation.

Laryngectomy.

Dr. Roswell Park (*The Medical Press of Western New York*, Dec. 1885) successfully removed the entire larynx for intrinsic epithelioma, completely occluding the rima glottidis, from a man sixty-four years of age; a tracheotomy performed two weeks previously having failed to give relief. The patient at last report (private communication, Nov. 13th) was doing well, and expressed himself as much more comfortable than he had been for a long time. From other sources the writer was told that he was not wearing any artificial substitute for the larynx, and that he had reëngaged in the practice of medicine. The epiglottis was retained, and the first ring of the trachea was removed. The extirpation was conducted from below upward.

Partial laryngectomy has been successfully performed for epithelioma by Gersuny (*Anzeiger der k. k. Gesellsch. d. A.* in *Wien. Sitzung*, April 24, 1885; *Int. Centralbl. f. Lar.*, etc., Nov. 1885).

Dr. Eugene Hahn, in a recent lecture (Volkmann's *Klinischer Vorträge*, No. 260, Leipsig, 1885), gives a table of 76 cases of complete laryngectomy, 65 for carcinoma, 9 for other neoplasms, and 2 for inflammatory conditions and their sequelæ; and 15 cases of partial laryngectomy and resection, 7 for carcinoma, 3 for other neoplasms, and 5 for inflammatory conditions and their sequelæ. To Hahn are accredited 7 of these complete laryngectomies and 3 of the partial ones; but in the text he describes 11 personal operations. His views, therefore, are of especial value. The patient's strength permitting, he delays preliminary tracheotomy until just before the laryngectomy. He prefers the horizontal position and deep chloroform narcosis, the trachea being protected from reflux of blood by a close-fitting sponge-compress around the canula.

The details of the operative procedure will vary according to the nature of the disease and the extent of the neoplasm, making the following divisions:

1. Complete excision with removal of most of the soft parts.
2. Complete excision with retention of the soft parts.

3. Unilateral excision.
4. Semi-resection, either anterior or lateral.
5. Partial resection.

The more of the soft tissues left, the sooner does the function of deglutition become restored.

Want of space prevents the extraction of further details from this valuable monograph.

Cocaine in Chorea of the Larynx.

Dr. Massei, of Naples (*Bull. de la Soc. Franç.*, tome ii. f. ii.), reports a case of obstinate spasmodic cough in a child of five years, in which, after all treatment had failed, cocaine, locally, gave temporary relief. The child was removed from treatment too soon to effect a permanent cure. The compiler agrees with Dr. Massei in considering laryngeal chorea an unfortunate designation for this affection. Dr. Garel, of Lyons (*Lyon Méd.*, July 19; *Annales des Mal. du Lar.*, Nov. 1885), acting on Dr. Massei's hint, has succeeded in curing, by local application of cocaine, a case of choreiform cough associated with epileptiform seizures.

Functional Paralysis.

Dr. Wm. Porter (*Journ. Amer. Med. Assoc.*, Sept. 26, 1885) reports a case of aphonia of eleven and a half years' duration, in a male subject, æt. thirty years, in which phonation was permanently restored by two applications of the induced current.

Spontaneous Perforation of the Trachea and Œsophagus in a Tabetic.

MM. Teissier and Favel report (*Annales des Mal.*, etc., Nov. 1885) a case of well-marked progressive locomotor ataxia, in which no definite history of syphilis could be obtained. The patient was found one morning in a comatose condition, and died that night. In addition to the characteristic lesions of the disease, there was found, *post-mortem*, a perforation of the trachea, situated in the posterior wall, about two centimetres below the inferior border of the cricoid cartilage, and communicating with the œsophagus. Prof. Teissier considers the lesion to be of nervous origin, due to trophic disturbance.

Foreign Bodies in the Œsophagus.

Successful cases of œsophagotomy continue to be reported, firmly establishing this therapeutic procedure. The compiler has ceased to attempt collecting all the reported cases. Other methods of removal deserve a little attention.

Dr. Geisselbert, a dentist, of Furth, finding it impossible to extract from the œsophagus of a servant the rubber denture she had swallowed during sleep, pushed it into the stomach. He administered a quantity of cotton thread cut into small pieces, and beaten up with white of egg. The result of this novel and ingenious device was highly gratifying. Four days later, the girl passed *per anum* the plate overspun by the cotton.—*Deutsche med. Zeit.*, April 13; *Med. and Surg. Rep.*, June 20, 1885.

A patient of DR. C. H. HUNTER, of Minneapolis, swallowed a plate with two teeth. After a few whiffs of ether, preparatory to a proposed œsophagotomy, the foreign body suddenly passed into the stomach. Three days later it made a safe exit *per rectum*.—*Med. Record*, N. Y., June 6, 1885.

Spontaneous expulsion of teeth and plate, together with a piece of bone caught in the throat seventeen days after the accident, in a case in which the œsophageal bougie failed to detect the obstruction, but dysphagia and localized pain continued; and a case of removal of teeth and plate *per orem*, with curved forceps, are reported by MR. JOS. THOMPSON, in the *Brit. Med. Journ.*, Feb. 28, 1885.

DERMATOLOGY.

UNDER THE CHARGE OF

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AND

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RECENT DERMATOLOGICAL LITERATURE.

DR. H. VON HEBRA'S recent brochure of sixty pages on "Elephantiasis" (*Wiener Klinik*, viii. and ix., 1885) is an exhaustive *résumé*, presenting a clear exposition of the disease; a complete bibliography is added. Those desirous of ascertaining the recent views as to the pathology, especially as regards the significance given to the presence of filaria, and the more modern methods of treatment, will find the present monograph complete on these points, as well as on all others.

THE TREATMENT OF LUPUS BY COLD.

Accepting the bacillar theory of tuberculosis, and that lupus is a tuberculosis of the skin, C. GERHARDT (*Deutsche med. Wochenschrift*, No. 41, 1885) has, in view of the well-known effects of cold on the development of the bacillus, treated the disease with ice. The applications were made by means of ice bags, and kept in contact with the patches for two or three hours, twice daily. In several cases in which this plan of treatment was tried, and in which the ordinary methods had measurably failed, the result, at the end of several weeks, was satisfactory.

TREATMENT OF CHRONIC ECZEMA.

BOCKHARDT (*Deutsche med. Wochenschrift*, No. 30, 1885) describes his method of treating chronic eczema, applicable to localized, infiltrated areas. The crusts being removed, the surface is thoroughly scarified with a lancet, which is usually followed by slight bleeding only, amenable to pressure with compresses, after which the officinal solution of potassa is rubbed into the skin until the horny layer of the epidermis begins to loosen. The surface is

now washed off with water, and dressed with cloth spread with diachylon ointment or olive oil, bound on. After twenty-four hours this dressing is removed, and for the next twenty-four hours is supplanted by water compresses. The appearance of the wound at this stage resembles an ulcerating surface, which is further treated every three days with applications of a lunar caustic solution, or with pyrogallic acid ointment. Healing takes place in from two to four weeks.

Etiology of Eczema.

Krœll has contributed (*Berlin. klin. Wochenschrift*, No. 40, 1885) the histories of several cases of eczema bearing upon the production of disease through reflex action. The cases are essentially similar to one previously reported (*Ibid.*, No. 18, 1883) by the same writer. In these cases the eczematous eruption seemed dependent upon a local irritation, as a boil, a burn, or the action of tincture of iodine, the lesion usually first appearing about the seat of the irritation, and subsequently involving symmetrical or remote parts. The author holds the view that the eruption in these instances, as also in many others, is due to reflected irritation of the trophic nerves.

A Case of Pachydermatocele, or Dermatolysis, Associated with Fibroma.

D. F. Keegan reports (*Indian Medical Gazette*, August, 1885) a case of pachydermatocele, or dermatolysis, associated with fibroma, occurring in a thin, spare man, a native of India, aged forty, who was successfully operated upon in the Indore Charitable Hospital of Calcutta. Two engravings accompany the article. The whole body was studded over with fibroma molluscum, varying in size from a pea to a walnut. In addition to the numerous fibromata, he was the subject of a huge pachydermatocele, which sprang from the left mammary region and hung down along his side, reaching to the level of the great trochanter of the femur. The tumor could be taken in the hand and laid on the supraclavicular region. The only portions of his body free from the smaller fibromata were the soles of the feet and the palms of the hands. Up to the age of ten years he was free from the disease, at which date the large growth began, the smaller tumors having formed since. His mother had a similar tumor of about half the size of his own, that grew in the same region. The growth is described as feeling like a long loose bag of integument, which, on being grasped between the fingers, gave arterial pulsations. The surface of the skin showed the follicles very distinctly marked, and the integument was thickened. The weight of the tumor after removal was two pounds and six ounces, and it consisted of thickened integument and areolar or connective tissue, well supplied with numerous bloodvessels. Dr. Keegan places the case on record to prove that the disease which Valentine Mott called pachydermatocele, and other authors call dermatolysis, is only an exaggerated form of fibroma molluscum.

The case resembles that figured by Virchow as the frontispiece to his work on *Tumors;* also that reported, with an illustration by Fritsche in Poland, and figured in Tilbury Fox's *Atlas of Skin Diseases*. There can be no doubt, in Dr. Keegan's case, as to the existence of true molluscum fibrosum, and we

think that the pendulous growth should likewise be regarded as a manifestation of that disease, and not as an example of dermatolysis. In typical cases of this latter disease, there exist no rounded fibrous tumors, the formation being merely a more or less diffuse or circumscribed hypertrophy of the integumentary structures.

Medicinal Soaps.

The subject of soaps (Volkmann's *Sammlung klinischer Vorträge*, No. 252, 1885) has been lately receiving the attention of Unna, of Hamburg. A basic soap of fixed composition, with which might be incorporated various medicinal substances, was prepared, consisting of sixteen parts best ox fat, two parts olive oil, six parts 38° Beaumé soda lye, and three parts Beaumé potash lye. This combination of the alkalies had the advantage of being less apt to blister the skin when medicinal substances are incorporated with the soap. The soap so made and composed is over-fatty—that is, possesses about four per cent. excess of fat over the amount necessary for complete saponification. In color it is yellowish-white, of waxy consistence, and permanent.

Although, theoretically, Unna considers that beef fat alone is the most perfect fat for soap manufacture, an advantage seems gained by adding one proportion of olive oil to eight parts of beef fat. The objection to cocoanut oil, from which a soap can be made which produces a good lather, is, that after continued use the skin becomes harsh and dry. Neutral soaps if used habitually tend to produce roughness and harshness, the natural oiliness of the skin being too completely removed. Hence an excess of fat was found to add to the value of the soap, both for medicinal and toilet purposes.

For skins in which there is naturally a tendency to harshness and dryness, the soap was found exceedingly valuable; the skin after its use is smooth and pliable. This basic soap Unna designates over-fatty basic soap (über fettete Grund seife).

For thinning down the horny layer in parakeratoses and in acne, an "over-fatty marble soap," made up of one part of the basic soap and an equal quantity of very finely powdered marble, is highly spoken of. It is far superior to the pumice-stone and sand-soaps, inasmuch as it accomplishes the same purpose, and has the advantage of leaving the surface normally unctuous and smooth. Several other combinations are advised for special purposes. Thus "over-fatty ichthyol soap" is especially valuable in rosacea. If the disease is mild in character, washing the parts with this soap and hot water two or three times daily is commended. If the soap lather is allowed to dry on, as is advisable in severe cases, a stronger effect is produced. The washing with this soap does not necessarily prevent other measures being carried out at the same time, using the soap during the day and pastes or salves, if desirable, at night. "Over-fatty salicylic acid soap," and other medicinal incorporations, are mentioned, and advised for the disorders for which the drugs are in other forms, as salves and lotions, often employed.

Topical Applications in Diseases of the Skin.

The past several years have shown a decided advance in the methods of external treatment of cutaneous diseases, and in a recent paper by Brooke

(*Medical Chronicle*, Manchester, Oct. 1885) these various methods are mentioned, and several new plans, which the author had found valuable, added. In regard to the application of an ointment the uselessness of simply rubbing it over the surface compared to the correct method of application by spreading upon muslin and binding down to the parts is casually referred to. Hebra insisted upon this latter method of applying almost all ointments, and although its greater efficacy is admitted, it is only exceptionally practised.

The introduction by Unna of the medicated salve "mulls," and the gutta-percha plaster, was an important innovation. The former are prepared, as is now tolerably well known, by incorporating the medicinal substances with a firm basis, usually of benzoated lard and suet; this is spread upon mull, and is kept ready for application. The gutta-percha plaster, made of gutta-percha faced with some adhesive substance containing the desired medicament, the whole of which is backed with muslin, is more elegant than the salve mull, but is, unfortunately, expensive.

The author has devised another method, a modification of the above, but much more simple and less costly. The medicament is made up with a stiff basis in the form of a stick of cosmetic, the basis composed of wax, cocoa butter and oil. This when rubbed on the skin leaves a thin coating which is scarcely perceptible, and yet satisfactory. If applied to covered parts, a piece of impermeable adhesive plaster sufficiently large to overlap the ointment, may be placed over it, so as to protect the clothing, and keep the application from shifting. The author has found that this method in the treatment of psoriasis is better than that by traumaticin as advised by Auspitz.

As an impermeable back for hard ointments Brooke finds a gutta-percha tissue affixed to a thin, smooth piece of paper which had been permeated by gum-water, tolerably satisfactory. As it is not very pliable, bandaging is necessary when applied about joints.

Another useful basis consists of a mixture of equal parts of almond oil and thick gum-water. When rubbed into the skin it soon dries and forms a thin coating. In eczema, this oil-gum with 15 to 20 per cent. of salicylic acid is often serviceable. The same combination is valuable also, as an auxiliary, in lupus. The oil-gum, with 10 per cent. of pyrogallic acid, applied to patches of psoriasis, acts favorably. The deficient adhesiveness of the gelatine preparation may, Brooke suggests, be overcome by the addition of gum. The compound tincture of benzoin, as suggested by Taylor, of New York, is also a valuable means of applying medicaments to the skin. The application of tar, in the form of a tincture, a well-known method, forms a smooth protective covering; and may, in fact, be used as a vehicle for other drugs.

Chloride of Calcium in Scrofuloderma.

In addition to other affections of a scrofulous nature, Dr. R. W. Crighton, of Edinburgh (*Practitioner*, September, 1885), has had good effects from the administration of calcium chloride, in enlargement and suppuration of the cervical lymphatic glands, and in cases in which the overlying skin has become ulcerated and shares in the destructive process (scrofuloderma). To children the dose varies from one to several grains, according to the age; to adults the dose is much larger, twelve to fifteen grains. A preference is ex-

pressed for the crystallized chloride of calcium, as the anhydrous salt has an unpleasant taste and forms a turbid solution. It is best given in milk, and after meals.

Treatment of Ringworm of the Scalp.

Dr. A. J. Harrison (*Brit. Med. Journal*, Sept. 5, 1885), in a paper read before the British Medical Association, advises the treatment of ringworm patches of the scalp with an alkaline solution, preferably liquor potassæ, containing in every ounce a half drachm of potassium iodide, subsequently applying an aqueous solution of corrosive sublimate, three grains to the ounce. The liquor potassæ softens and dissolves the hairs, and carries the potassium iodide to the root, and also facilitates thorough penetration of the corrosive sublimate solution. Reaction takes place within the follicle, biniodide of mercury—a powerful parsiticide—is formed, which proves destructive to the fungus. The hair should be clipped short before beginning treatment. The method is claimed to overcome the chief obstacle to successful treatment of ringworm of the scalp, namely, the difficulty of bringing the parasiticide in contact with the fungus in the hairs and hair-follicles.

MIDWIFERY.

UNDER THE CHARGE OF

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Erysipelas of the Face in the Husband, with Recovery; Puerperal Septicæmia in the Wife, Followed by Death.

The coincidence of erysipelas and of what was designated formerly under the generic name of puerperal fever has been often observed in hospital and private practice. Without wishing to prejudge the question of complete identity, the following observation by Dr. Ambroise Guichard (*Arch. de Tocologie*, July, 1885, p. 621) seems to demonstrate the contagiousness of the husband's erysipelas to the wife, who had been but lately confined and was seized three days after delivery with puerperal septicæmia, or what might be called "uterine erysipelas."

Mrs. D., aged twenty-seven, wife of a railway stoker, was delivered for the fourth time on Jan. 17, 1885; the three preceding confinements had been perfectly normal. The fourth labor was normal and very rapid, the child being born before the arrival of the midwife, who had only to extract the placenta, which was lying in the vagina. The patient was left in charge of a relative, who allowed her to remain in the soiled linen and did not wash or otherwise clean her. On the 20th of January the patient was taken with shivering, chattering of the teeth, fever, diarrhœa, tenderness of the abdomen, suppression of the lochia, and was half delirious. Things grew rapidly worse in spite of antiseptic injections, quinine, and other remedies; the temperature ran high,

peritonitis became general accompanied by tympanites, and the patient died on the 30th of January. On the occasion of Dr. Guichard's first visit on the 23d of January, attention was called to the condition of the husband: he was suffering from facial erysipelas. On making inquiries, it was found that on the 15th of January he had been seized with shivering and fever; the same evening erysipelas began on the nose and then spread to the forehead, scalp, and posterior part of the neck. The attack ran a mild course, and by the 30th of January the erysipelas was quite cured. Three important dates may now be noticed:

Jan. 15, 1885. Onset of facial erysipelas in the husband.

17*th*. Delivery of the wife.

20*th*. Onset of puerperal mischief.

The husband, though mostly absent at work, returned home every day; in spite of his erysipelas he continued at work till January 23d, and continued as usual to share the same bed with his wife: it was only after the visit on the 23d that he began to occupy a separate bed, and by this time his wife was already seriously ill. The midwife cannot be suspected of conveying infection, for she had not been in any way exposed, and had arrived too late at the labor to undertake any manipulative interference. An investigation into the antecedent history of the wife proved that she had not been exposed to any other sources of infection; her child remained well, and, though of necessity living in the same room, suffered no trouble in connection with the umbilical wound.

The following deductions seem warrantable:

(1) The husband communicated the infectious germ to his wife; the portal of infection was through the external or internal genital organs.

(2) This single case does not allow of our determining the nature of the troubles of lying-in women described under the name of puerperal fever; but in the present case one common infectious agent or microbe must have been the common starting-point of facial erysipelas in the man and septicæmia of the internal genital organs in the woman.

(3) As a prophylactic, the physician ought to remove every case of erysipelas from the neighborhood of lying-in women, and therefore to forbid all cohabitation before, and for some time after delivery with the husband, if the latter is suffering from erysipelas.

Strict antiseptic precautions ought to be carried out in the surroundings of the woman before, during, and after confinement. The accoucheur and the nurses should not forget that they may be the direct medium of contagion, and should, in consequence, neglect no antiseptic precaution.

A lying-in woman should never be placed in a room previously inhabited by a case of erysipelas, until the chamber has been completely disinfected.

Brow Presentations.

Dr. E. Blanc, in the *Arch. de Tocologie* (July, 1885, p. 614), analyzes and studies an interesting work which has just been carried out by M. Devars, on delivery in brow presentations; it is proposed in a rapid analysis to call attention to the facts, either new or original, which have been brought forward in this investigation. M. Devars divides his work into five parts, viz., the history of the subject, the signs and frequency of these presentations,

their mechanism and etiology, their diagnosis, and, lastly, the therapeutical indications to be derived. The historical part it is not necessary to dwell upon, nor upon the signs of these presentations furnished by the anatomical peculiarities of the frontal and neighboring regions; attention may be turned at once to the question of frequency. Cases of brow presentation do not seem to be very common. Heinricius, in the Maternity of Elsingfors, found only 12 instances out of 5000 confinements; Mangiagalli, during a period of five years, collected 64 cases, 17 of which occurred at the Maternity of Milan, but does not say out of what total of labors. Devars, examining the records of the Clinique d'Accouchements at Lyons for the last five years, found 5 cases in 1402 labors.

By what mechanism is the expulsion of the head effected in these cases? It may be described briefly as follows: The superior maxillary bone corresponds to the occiput in vertex presentations, to the chin in those of the face; whatever the position of this bone at the onset of labor, the expulsive forces will always tend to bring it beneath the symphysis pubis, which is to furnish it with a *point d'appui*, while the longitudinal diameters of the head, the naso-bregmatic, the naso-sagittal, and naso-occipital clear in succession the pelvic outlet and the vulva. After the occiput has become freed from the posterior commissure, the mouth and chin will appear in front of the pubis. The deformity of the head in these presentations is considerable; the head compressed in its suboccipito-mental diameter assumes the form of a triangle, the base of which, viz., the occipito-frontal diameter may measure 13, 14, or even 15 centimetres (5.1, 5.5, or 5.9 inches). Such a lenthening of the longitudinal diameters of the head would appear a source of danger to the vulva and perineum, but it is to be noted that at this stage the face rests by the superior maxillary bone or by the nose against the back of the symphysis, while the forehead is free in the vulvar orifice; a naso-occipital diameter shorter than the occipito-frontal clears the vulva, and it is only after the occiput is disengaged from the posterior commissure that the chin appears below the pubic arch. Too great a distention of the soft parts is thus avoided. Devars admits an equal likelihood of these presentations becoming transformed into those of the vertex or face; Mangiagalli objects to this; he compares the fœtal head to a triangle having its apex at the forehead and its base formed by the occipito-mental diameter; but one of the sides, viz., the fronto-mental, is the shorter; instead, then, of the base of the triangle engaging parallel to the pelvic inlet, it will be inclined at an angle, the forehead will descend lower in the pelvic cavity than the occiput, and the engagement of the head in the form of a brow presentation is thus rendered possible: clearly, if this presentation undergoes a transformation, the face should succeed to the brow. Belluzi never saw a brow presentation end in a vertex presentation. Which of these views is correct? Probably a distinction should be made according as the head is slightly engaged at the inlet, or has descended well into the cavity of the pelvis. In the first case the position of the head may change, producing readily the presentation of either face or occiput; in the second, the chin being lower than the occiput, a change to the occipital presentation is less likely.

Among the causes which produce brow presentations may be quoted the resistance of the cervix, uterine obliquity, hydrocephalus, thoracic or ab-

dominal dropsy, twists of the cord round the neck of the fœtus, small size of the child, and, lastly, pelvic contractions. Observations made by ourselves experimentally, as well as the opinion of numerous authorities, confirm the belief that contractions of the pelvis play an important part in producing the presentations now under consideration.

The diagnosis is not difficult, as a rule; the prognosis is serious for both mother and child, but especially for the latter. M. Devars puts the infant mortality at nearly fifty per cent., while other authors make it only twenty or twenty-four in the hundred. In 9 cases recorded by M. Devars, delivery occurred spontaneously in 3, and in 6 forceps were used; in the 3 cases two mothers and two children died, while in the 6 cases only one infant succumbed.

Regarding treatment, it is to be noted that in most cases operative interference is called for; among the modes of procedure most approved are change of presentation, effected by manual manipulation, version, the use of forceps and of the lever, and, finally, as a last resource, craniotomy. While the head is still at the pelvic inlet, change of presentation is particularly applicable; indeed, it may be attempted even when the head is already in the pelvic cavity, though in this latter case we should endeavor, if possible, to bring down the chin.

Biniodide of Mercury as a Disinfectant in Obstetrics.

This subject was brought forward by Dr. E. P. Bernardy, at a meeting of the Obstetrical Society of Philadelphia, on June 4th (*Medical News*, Aug. 8, 1885).

In three cases, the lochia had become offensive after delivery. The uterus was washed out with biniodide, and within twenty-four hours the offensive odor ceased, and from that time the coexisting symptoms began to improve. The method he had pursued in making the solution was: Take three grains and a half of biniodide of mercury, well triturated in a mortar, and rubbed with one quart of boiling water, slowly added, giving a solution of 1 to 4390. This solution he had found non-irritating, but equally efficacious in its action to bichloride 1 in 2000. Indeed, in one case in which the bichloride had been first employed, the result appeared to be decidedly in favor of the biniodide. Moreover, he points out that, owing to the smaller quantity of mercury in the latter, the risk of salivation is diminished.

Case of "Missed Labor" with Cæsarean Section.

Dr. Stanley P. Warren reports (*American Journal of Obstetrics*, July, 1885) the following instructive case: Mrs. McD., aged thirty-two, married, had one child thirteen years ago, but had not been pregnant since. Last menstruated in January, 1884; usual symptoms of early pregnancy followed. At end of April had symptoms of miscarriage—pain and hemorrhage—for some days, followed by discharge from vagina "like thick molasses."

May 2. Temperature and pulse raised. Cervix enlarged, tender, and discharging a thick bloody fluid in small quantity; abdomen tympanitic, somewhat swollen and sensitive. In right iliac fossa a tumor was apparent to sight and touch, about as large as closed fist, pear-shaped. The above men-

tioned signs of metroperitonitis in a few days culminated in an attack of general peritonitis, from which, however, the patient recovered and was convalescent in fifteen days.

July 5. Iliac tumor had disappeared, but another had succeeded it in median suprapubic region. It was unquestionably the pregnant womb, for fœtal circulation was distinct, and she had felt movements for several days.

October 29. Term. Signs of labor set in; pain in back, and especially in right side of womb. The pains, apparently caused by excessively active fœtal movements, were not rhythmical, and did not present the expulsive character of true labor-pains. Per vaginam, cervix long, external os open, inner os too high to reach. Externally, uterus prominent, as though there was not much liquor amnii. Child placed almost exactly transverse with head to right. Attempt at external version failed to effect any change in position. No further progress made.

November 7. Child was found to be dead.

25*th*. Peculiar pains like those a month before.

December 19. Still no progress. A discharge of blood occurred, and "some pieces of flesh" were passed a day or two ago. Dr. Warren remarks (as it was afterwards proven that the membranes were unruptured), this "show" may possibly have been from slight detachment of the placenta. Uterus lower down in abdomen. External os dilated and flaccid, resembling mouth of a bell. Rest of cervix is a long, rigid tube. Several times in next day or two middle finger, up to second joint, was pushed through it, and just into uterine cavity. Some part of fœtus was felt there, and conjectured to be the breech. Cervix easily drawn down to vulva, and after each examination distinctly felt to contract. Hot vaginal injections and quinine given, but failed to provoke uterine action. Subsequently inner os closed so tightly that it was impossible to push anything through it, and there was not the slightest uterine action. Nocturnal pain through abdomen and side of uterus; dorsal decubitus only; chilly; pulse 110–120; temperature 101°–102°; intestines torpid. Induction of labor decided upon.

29*th*. Found impossible to pass sponge-tent through closed inner os. It was left in cervix for twelve hours, but without making any perceptible impression upon it.

30*th*. Under full anæsthesia, with chloroform, it was found possible to pass finger slowly through long cervix into cavity, where same presenting part of fœtus was felt as before. Canal closed as tightly as ever on withdrawing finger. Attempts at forcible dilatation were then made successively with small uterine dressing forceps, with placental forceps, and with a cranioclast, producing, however, but little effect on the rubber-like band of the internal os. The blades were separated as widely as possible while being drawn out of the stricture. During this proceeding the patient lost about one quart of blood, and a state of profound shock ensued. On examination, a rent was discovered posteriorly above the neck in Bandl's zone, and the cervix was found to be torn nearly away from the body.

After the patient had been partially rallied, abdominal section was performed. About one pint ascitic fluid on left side. Peritoneum found to be so closely adherent to uterus that hysterectomy was rendered impossible, and the adhesions were with difficulty separated far enough to incise the uterus. Uterine incision was made in middle line, four inches in extent, directly

into cavity. Lower edge of placenta was wounded, but there was no hemorrhage. Cut edges of womb were not over one-quarter of an inch thick, and did not bleed. The cavity was full of thick, grumous débris. Fœtus still occupied same position as in October. It weighed eight and a half pounds, and was extracted with some difficulty. During the process a further considerable laceration was occasioned at an angle to the incision on right side. Stricture of inner os and the rent were verified from within. Uterus was sutured with catgut and the abdominal section closed. After delivery, and, indeed, during it, there was not the slightest contraction of uterus, and its tissues were evidently far advanced in atrophy. Patient died twenty-eight hours after operation. No autopsy could be obtained.

Pulmonary Thrombosis in Puerpera.

Dr. Peter Young contributes to the *Edinburgh Medical Journal*, July, 1885, p. 41, an interesting paper on this subject. The main features of the case on which it is founded are shortly as follows: A widow, left with four children, the eldest seventeen years old, was, seven years after her husband's death, seduced under promise of marriage, but at the time of her confinement the engagement remained unfulfilled, and, moreover, the paternity of the child was denied by her former admirer—a circumstance which had a very depressing effect upon the widow, who kept all her sorrow to herself. Labor was natural. Subsequently, though the pulse remained somewhat frequent and the patient wore a listless, apathetic expression, no untoward symptoms supervened. On the eighth day after delivery she was able to dress and to sit up for three or four hours. She retired to bed that evening apparently quite well. Next morning she was found dead in bed, with features calm and placid, eyelids open and pupils dilated, limb semiflexed, and body resting on left side in the attitude of natural sleep.

In the post-mortem examination the peritoneum and uterus were found to be healthy, fundus on level with brim of pelvis, uterine and iliac veins, as well as vena cava, also healthy, but containing a good deal of dark fluid blood. Lungs pale and mottled with dark pigment, but otherwise healthy. Heart flaccid, and ventricles filled with dark fluid blood; muscular substance very friable, pale, soft, and distinctly fatty, especially that of right ventricle, which is thinner than natural. Pulmonary artery filled with soft, dark-red clot, smooth and non-adherent, so that it could be easily drawn out of the vessel.

This case Dr. Young looks upon as one of those exceptionally rare instances of primary coagulation of the blood—in other words, of true thrombosis of the pulmonary arteries. In this particular case there were three main factors favoring the coagulation of the blood in that situation: (1) The fatty state of the cardiac muscle. (2) The depressed mental condition of the patient, which tended to lower the heart's action. (3) The condition of the blood, clots being more apt to form when from any cause the flow is retarded than when the blood is in a healthy condition.

Judging from the history of the case, he is inclined to think that pulmonary thrombosis has different clinical features from those of pulmonary embolism. In pulmonary thrombosis we may have no indication of impending danger

except in the condition of the pulse. The patient makes no complaint except probably of weakness, and death may occur during sleep, without a pang, owing to the gradual stoppage of the heart's action. Unfortunately, the patient was so averse to be disturbed that no examination was made of the heart during life.

With regard to treatment, in addition to keeping the patient quiet, and strengthening the heart's action by the administration of digitalis and carbonate of ammonium, it is of primary importance not to allow the patient to lie down until all signs of dyspnœa have disappeared, or the heart's action is good. The assumption of the erect or sitting posture in these cases is very important, as the muscles of respiration then act to much greater advantage, and the free expansion of the lungs, by facilitating the flow of blood in the pulmonary vessels, greatly assists the laboring heart to perform its work. In the recumbent posture, on the other hand, if there be any clots, whether primary or secondary, in the pulmonary arteries, the heart will experience more difficulty in driving on the blood, and there will, consequently, be a greater tendency for it to come to a standstill. In many of the cases of persons found unexpectedly dead in bed, doubtless, death has occurred in the manner indicated, an event which might have been averted if the sitting posture were adopted during sleep, until by the administration of appropriate remedies the heart's action is strengthened and better fitted to perform its functions.

Rupture of the Perineum.

Dr. Frank H. Hamilton, at a late meeting of the New York County Medical Association (*Medical News*, July 4, 1885), made a few practical remarks on this subject.

Rupture of the perineum, he said, may be due to one or more of several causes. (1) The perineum itself unusually deep in antero-posterior direction, or thinner, more delicate in structure, and less elastic than natural. (2) Deficient curve in sacrum and coccyx. (3) Large unyielding head. (4) Too rapid descent of presenting part under the influence of strong uterine contractions. (5) The use of forceps, especially when retained in position until the head has passed the vulva, or when, by their use, the labor has been so much expedited that the perineum is "taken by surprise," or the head of the child is brought down to the lower strait before it has been properly moulded.

The practice of "supporting the perineum" Dr. Hamilton looks upon as useless, except where pressure is made with the purpose of carrying the head forward toward the pubes in those rare cases in which, from the lack of curve in the sacrum and coccyx, or from any other cause, the vertex fails to take that direction.

He is entirely opposed to the immediate or primary operation for ruptured perineum on the following grounds: (1) The rent under judicious management frequently becomes partially and sufficiently closed spontaneously, so that in some cases operation is unnecessary. (2) The extent of the lesion immediately after delivery often cannot be accurately determined. (3) The already prostrated condition of the patient and the contused state of the tissues, render any operation at such a time undesirable. (4) The liability to failure after operations performed under such unfavorable circumstances is much greater than in secondary operations.

Ten Cases of Pregnancy and Labor Complicated with Fibroids.

In determining the coexistence of pregnancy with fibroid tumors of the uterus, Dr. James R. Chadwick (*Boston Medical and Surgical Journal*, Aug. 30, 1885) attaches much importance to the following diagnostic points: (1) Unduly rapid growth of the fibroid tumor when such has been known to exist previously; and (2) an area of flat percussion extending beyond the limit of the tumor or tumors. These, in association with other more generally recognized signs of pregnancy, such as bluish discoloration of the vulva and cessation of menstruation, may greatly assist the diagnosis, especially in the early months of gestation before other more certain signs are obtainable.

In one case the patient miscarried at three and a half months. The others were delivered at term. In four of the cases inertia set in, and forceps were called into requisition. In two cases, in which the tumor (submucous) partially filled the pelvis, and the child was placed transversely, podalic version was resorted to. In one of these, owing to the size and position of the tumor, intrauterine manipulation was carried on with difficulty, and extraction of the child was accomplished by the exercise of considerable force. The placenta, situated mainly over the tumor and encroaching upon the os uteri, was removed by the hand. It was then found that the vagina was torn through transversely immediately below the posterior lip of the cervix, to which the tumor was attached. The patient developed symptoms of peritonitis on the third, and died on the fifth day after delivery. In the other the tumor plugged the os uteri immediately after delivery. Symptoms of septic poisoning supervened three days later, and death occurred on the twenty-third day. The child in this case was stillborn.

In the remaining seven cases the mothers recovered; two of these, however, after slight attacks of septicæmia. In both of these, forceps had been used, and in one of them, complicated by preëxisting kidney mischief, the child was stillborn in occipito-posterior position. The tumor in this case was also of the submucous variety.

The degree of danger, both to mother and child, undoubtedly depends greatly on the precise location of the tumor and the intrauterine manipulations rendered necessary for the completion of delivery. Submucous tumors situated low down in the uterus, so as to interfere with the delivery of the child, increases the gravity of the prognosis. Subperitoneal fibroids, especially when situated high up, are rarely attended with dangerous results.

As regards the tumors in six of the eight patients who survived, the tumor had apparently disappeared within a year. In one it remained apparently unaltered, and in the remaining case, in which two tumors coexisted, miscarriage was followed by disappearance of one and persistence of the other.

The Influence of Intermittent Fever on Pregnancy and on the Fœtus.

Behrmann (*Berliner klinische Wochenschrift*, Aug. 24th–Sept. 7, 1885) points out that statistics have shown that pregnant and lying-in women enjoy a certain degree of immunity from the effects of malarial poison; but as regards the influence of that poison on the progress of parturition and labor when once it is present in the system, there is difference of opinion; *e. g.*,

some obstetricians assert its tendency to cause abortion; others deny such a tendency. Moreover, cases illustrating the influence of intermittent fever in the mother on the fœtus are very rare; Leroux, from observations in eighteen cases came to the following conclusions: (1) Since the children of women who have suffered from intermittent fever are born with hypertrophied spleens, it is probable that the fœtus may be infected by the mother. (2) Children born of mothers suffering from intermittent fever often inherit a predisposition to that disease, since soon after birth they are attacked by malarial fever, belonging to the same type as that of the mother. Other similar cases are on record.

Some observations recently made in a malarious district and published by Lvov, are of especial interest; the conclusions he has arrived at are as follows:

(1) Intermittent fever is very common during pregnancy, and occurs more frequently in the second than in the first half.

(2) Pregnancy has no influence over the length of interval between the attacks.

(3) Intermittent fever coming on during pregnancy is difficult to cure, and when recovery has taken place, relapses are very common. Severe attacks may terminate the pregnancy prematurely.

(4) Parturition takes place on the day and at the hour at which the febrile paroxysm usually sets in.

(5) During the first stage of labor, the febrile paroxysm often shows itself; running the same course as during pregnancy. During the puerperal period, also, attacks are very liable to recur, following the same type, except that the intermission is never complete.

(6) Attacks of intermittent fever during the puerperal period do not render the woman more liable to other puerperal diseases.

(7) The fœtus is affected by these malarial attacks as by any other elevations of temperature; its movements and cardiac sounds are affected in much the same way as when the mother is attacked by typhus (typhoid) fever.

(8) A prolonged and severe attack of intermittent fever may lead to the early death of the fœtus.

(9) Intermittent fever in the mother may affect the intrauterine fœtus with the same disease.

Behrmann concludes his paper by recording two cases which came under his personal observation; they are especially interesting, inasmuch as the malarial infection of the intrauterine fœtus was easily proved.

In the first case, the mother had for four months before her confinement suffered from tertian intermittent fever. Labor came on during a paroxysm and progressed favorably. The newborn child was somewhat cachectic in appearance and weighed about 2800 grms. (6 lbs. 2 oz.). During the first day nothing unusual occurred. But about 5 P.M. on the second day it suddenly began to cry, and severe convulsions set in, lasting twenty minutes, its face becoming very cyanotic. On the cessation of the convulsions a hot stage came on, lasting three hours. Pulse 160; temperature 40.5° C. (104.9° F.) On examination the splenic region was found to be sensitive, the baby crying when it was touched. The lower edge of the spleen could be felt 1½ inches below the ribs. On the third day post-partum, the child was well; on the fourth, at almost the same hour, a similar attack came on as on the second

with, if possible, even severer symptoms. On the sixth and eighth days attacks again recurred but much slighter, quinine having been administered in the interval. The child began rapidly to improve, and finally quinine entirely cured the attacks. It was evident that the child had been infected during intrauterine life, since it was nursed not by its mother, but by a robust wet-nurse; moreover, its attacks came on on similar days, and at the same hour, as those of the mother.

In the second case, the mother had suffered for three months before her confinement from quotidian fever. The child when born was quite healthy, but on the second day and at the same hour as the attacks of the mother used to set in, it became restless, cried, and became convulsed. Its spleen was found moderately enlarged. On the next three days similar attacks occurred at 3 to 3.30 P.M., which was the hour at which the maternal paroxysms came on. This case differed from the first inasmuch as no complete intermission of the symptoms took place, the temperature in the intervals varying from 39° to 32° C. (102.2° to 89.6° F.). Behrmann considers, however, that the enlarged and sensitive spleen, the regular exacerbations of the paroxysms, the malarial attacks in the mother, and the disappearance of the symptoms in the child on the use of quinine, were sufficient to establish the diagnosis that it was suffering from quotidian ague. This child also was not suckled by its mother; it was brought up on cow's milk.

Double Uterus and Vagina.

The following case is described by Dr. V. S. Kemarski in the *Vratch* (*Lancet*, September 5, 1885). Patient æt. nineteen, had never been pregnant before. When she first came under observation labor had commenced and membranes had ruptured. On examination per vaginam a membrane, which proved to be a vaginal septum, was found rolled up into a cord. During the pains a depression could be seen externally in the abdominal wall above the umbilicus, having an oblique direction downward from right to left. On the left was another tumor, also contracting, but less resistant to the touch than the other. As labor advanced, the groove disappeared when the fundus had reached the level of the umbilicus. The appearance then was of an arch with two horns, the right being larger than the left. Slight hemorrhage occurred from the vulva as the head approached. Delivery was effected naturally, and the placenta was born about three hours after the head began to descend through the pelvic cavity. Subsequent examination showed that the attachment of the longitudinal septum commenced at a distance of $1\frac{3}{4}$ inches from vaginal orifice on posterior vaginal wall, and at a distance of 1 inch on the anterior wall. This septum, dividing the upper two-thirds of vagina into equal portions, had been torn through during delivery. Vaginal portion of uterus was single, but traces of division could be detected on both lips. Within the cervical canal was a thin and somewhat tightly distended antero-posterior septum which appeared to extend to the fundus and to divide the uterus into two unequal cavities. The right was the larger, and admitted the sound a distance of 2 inches; the left, the smaller, a distance of $2\frac{1}{2}$ inches. Pregnancy had occurred in the right one. The cavities appeared to be independent, one of the other.

The Treatment of Prematurely Born Infants.

Every one knows how great is the mortality among prematurely born infants, and what special precautions are necessary if any hope of rearing them is to be entertained. The importance of maintaining a comparatively high temperature, and the need of carefully regulating the nourishment have, together with other details of treatment, been well brought forward by other authors, but at present M. Tarnier (*Arch. de Tocologie*, Sept. 1885, p. 819) draws attention to two additional precautions, viz., the use of a "couveuse" and "gavage." The former is too well known to need description. In using it he employed a temperature between 30° and 37° Cent. (86° F., 98.6° F.), the average being about 32° Cent. (89.6° F.). It is difficult to lay down any exact rule, but, as a general guide, we may say that the more feeble the infant the higher should the temperature be maintained. Children may be kept in the "couveuse" during a period varying from a few days to six weeks. There does not seem to be any danger incurred by withdrawing them for short periods for purposes of cleanliness or of nourishment.

In practising "gavage" he uses an apparatus which is in miniature the same as that employed by Dr. Faucher for adults. It consists simply of a red caoutchouc catheter (size No. 18, Charrière), to the upper end of which is fixed a small glass cup. In employing "gavage" the child is held on the knee of the operator, the head is slightly raised, the catheter is oiled and then introduced as far as the base of the tongue, when the child, by the instinctive movements of deglutition, carries it on to the entrance of the œsophagus; it is now pushed on gently until it has traversed the whole length of the œsophagus. After the catheter has passed a distance of fifteen centimetres (nearly six inches) we may conclude it has reached the stomach; the nourishing liquid is now poured into the glass cup, and soon by its weight penetrates into the stomach, leaving the cup and the catheter empty. In withdrawing the catheter, which should be done after a few seconds, it is needful to do so rapidly, as otherwise the fluid injected follows the catheter and is rejected by regurgitation.

What nourishing fluid is best? M. Tarnier has tried asses' milk either alone or sweetened, or mixed with beef tea, but believes that human milk is preferable to any. How many times in the twenty-four hours ought "gavage" to be employed, and what amount of milk should be administered on each occasion? It is difficult to lay down any definite rules, since much must depend on the age and strength of the infant; but if required to formulate any general rule, he should say, the meals must be more numerous and the amount of milk imbibed must be diminished according as the age of the child is less, and its vital powers more feeble. Eight grammes (123.456 grains) of milk are sufficient for one "gavage" when the child is very small and born considerably before full term. When the "gavages" are in excess, a very curious phenomenon arises, the child rapidly grows in volume and weight, but this is due to a considerable œdema of the whole body. As this œdema rapidly disappears when the supply of nourishment is more limited, he thinks it must be considered as a result of hypernutrition; if the quantity be not diminished, or if it be increased, indigestion sets in, and the child succumbs to gastritis and enteritis.

The infant shown is one of twins, born on June 8th. It remained in the "couveuse" until July 20th. From June 8th to June 12th "gavage" was employed every hour with eight grammes of human milk; from June 12th to July 5th "gavage" was employed every three hours with sixteen grammes of human milk, and in the interval of two feedings milk was allowed to trickle into its mouth; after July 5th the child was able to suck, and "gavage" was discontinued. In some cases the child is too weak to be entirely suckled, and then breast-feeding and "gavage" may be combined; during the early days of "gavage" the child's body weight may decrease, but later it rises again. Two of M. Tarnier's cases were born soon after the one hundred and eightieth day of intrauterine life, and have been successfully reared; he does not altogether despair of rearing premature children, born even before the one hundred and eightieth day, thanks to "gavage" and the "couveuse."

Abdominal Autotransfusion in Cases of Post-partum Cerebral Anæmia.

Cases are occasionally met with in which the removal of large masses from the abdominal cavity (*e. g.*, hydrops amnii, twin births, large collections of peritoneal fluid) is followed by extremely alarming symptoms, not uncommonly leading to death from cerebral anæmia. It is probable that in such cases an enormous quantity of blood collects in the abdominal venous system (which we know is capable of very great dilatation), owing to the sudden diminution of the accustomed pressure, and that the disastrous results are due to the consequent anæmia of the brain. Ordinary remedies do not act powerfully enough in such an emergency.

Koppe (*Centralbl. f. Gyn.*, Sept. 19, 1885), on meeting with a case of this description, tried a new device for restoring the normal distribution of blood, and his experiment was crowned with success. The patient was a primipara, in whom the abdomen was most unusually prominent; the skin over it was extremely stretched, and all the other signs of excessive distention were present. Conjugata vera about 3.2 inches. It was possible to diagnose the presence of twins. During the labor great difficulties were met with: the first child could not be delivered without perforation; the second was smaller in size, and extracted by pulling at the feet. Both placentæ were expelled without much loss of blood, and the uterus contracted well. The labor appeared to be satisfactorily terminated, when suddenly the patient became pale and collapsed; no external hemorrhage had occurred, and the uterus continued well contracted as before. Rupture of the uterus and hemorrhage into the peritoneal cavity seemed out of the question at this stage. The only other supposition was that a large accumulation of blood in the abdominal veins had taken place. The patient's head was lowered and brandy administered, but without effect. On the contrary, the pallor seemed to increase, and the patient appeared beyond hope of recovery. Koppe, at this moment, resolved to try to reapply pressure to the abdominal veins, which, by the emptying of the uterus, were now under much less pressure than before. He used for this purpose a small, soft pillow, which was very firmly pressed down on the abdomen, and bound on. A beneficial change was immediately apparent; the patient regained her color; consciousness returned, and before long she was fully restored. Koppe believes that the cerebral anæmia and

pulselessness of his patient were due to a large amount of blood being removed from the general circulation and engorging the abdominal veins, and that the extra-abdominal pressure applied by the pillow made up for the loss of intra-abdominal pressure due to the birth of twins and the discharge of the two placentæ and the liquor amnii, and caused the excess of blood in the abdominal veins to reënter the general circulation.

Inhalation of Oxygen in Puerperal Eclampsia.

Dr. Schmidt relates, in the *Russkaya Meditsina* (*Lancet*, Sept. 19, 1885), a case of puerperal convulsions successfully treated by inhalation of oxygen. The patient, who, in order to prevent the convulsions, had been kept constantly under the influence of chloroform, was unconscious and in a state bordering on asphyxia; but, after a few rather deep inspirations of oxygen, she began to show signs of returning consciousness, and, after inhaling rather more than a cubic foot of the gas, consciousness was entirely restored. No further convulsions occurred, and the patient made a gradual but complete recovery.

The New Sign of Pregnancy.

This sign, first described by Hégar, consists in a change in consistence of the lower segment of the uterus, by which it becomes very yielding and compressible, characters which make it easily distinguishable from the thick and firm cervix. This change is most distinct at the middle portion of the lower segment of the uterus, especially in the median line, the sides being much firmer and resisting.

Compes (*Berliner klinische Wochenschrift*, Sept. 21, 1885) publishes the results of observations made to verify the above sign, and has formed a high opinion of its value for diagnosis. The examination is made in the following way: The thumb is introduced per vaginam till it reaches the portio vaginalis, and the index-finger per rectum till it gets past the sacrouterine ligaments which correspond to the level at which the cervix joins the lower uterine segment (this procedure is sometimes facilitated by previously washing out the rectum). The disengaged hand is then placed on the abdomen immediately above the symphysis, and pressed down toward the index-finger (in the rectum), which is pushed forwards and explores the cervix, lower uterine segment (in all its portions), and, lastly, the higher parts of the uterus. The examination is facilitated by drawing down the portio vaginalis with a pair of forceps.

Compes looks upon this sign as a positive one of great value, utilizable at all periods of pregnancy, even as early as the second month, when other signs are so unreliable. He never met with it except during pregnancy, and believes the increased compressibility of the lower segment of the uterus (forming, as it does, the thinnest part of that organ) to be due to an infiltrated and succulent condition consequent upon pregnancy, and that the uterine contents can be pushed into this lower uterine segment in consequence of the increased elasticity of the wall of the upper segment of the uterus. It is, moreover, an almost certain sign of pregnancy, occurring, as far as is known, in but one other condition (retroversio uteri), and in that it is comparatively

little developed. In only one of the cases of pregnancy which Compes examined was this sign absent. He once found it so strongly developed (a fifth month pregnancy), and so great was the laxity of the anterior uterine wall, that it was possible to take up a fold of that wall and grasp it between two fingers.

Ruptured Uterus; Recovery; Subsequent Pregnancies.

Dr. A. E. Aust Lawrence reports, in the *British Medical Journal*, Sept. 26, 1885, the case of a patient who had had five stillborn and one living child. Delivery in the last-mentioned case was effected by forceps rather before the full time. Owing to slight pelvic flattening, it was decided to terminate the seventh pregnancy at the eighth month. Version was performed, but again, owing to the great difficulty in delivery, the child was stillborn.

Accordingly, in the next pregnancy, it was intended to induce labor at seven and a half months, but owing to a miscalculation on the part of the patient the operation was delayed till a month later. Labor-pains then set in of their own accord after a large dose of castor oil. The right hand and cord presented by the side of the head, and were pushed up. A binder was put on. Labor-pains continued very violently for about two hours, then suddenly ceased, and the woman complained of tenderness over the whole abdomen, but only when touched; she had no symptoms of attack, or collapse or hemorrhage. The hand and cord again prolapsed; the fœtus was turned and delivery effected without difficulty, the only abnormality noticed being that, as the hand was passed into the uterus, a slight rush of blood took place. Twenty minutes later the uterus was small and firmly contracted; the finger was introduced into vagina to remove placenta, and it was then found that the placenta had escaped into the abdomen through a rent running horizontally in the anterior wall of uterus, at the junction of its lower and middle segments. It was also observed that the uterine walls were very thin. The placenta was removed through the rent. The intestines appear to have been kept out of the rent by a distended state of the bladder—a condition which was maintained subsequently. With the same object in view, the hips were raised, morphia was freely given, and the diet limited to milk and ice. The temperature rose slightly from the third to the sixth day, but recovery was complete. Patient was up on the fourteenth day. There was a hard mass of cicatricial tissue in front of the uterus and an aperture in upper part of vagina, which ran up parallel to cervix and opened into it half an inch inside the os uteri. Subsequently patient became pregnant and was delivered at end of seven and a half months of a child which lived only a few hours. She is now six months advanced in her tenth pregnancy.

Dr. Lawrence also mentions two other cases of rupture of uterus, in which the collapse and shock, ordinarily present in such a grave condition, were conspicuous by their absence.

Notes of a Case of Chronic Inversion of the Uterus.

Under the above heading Mr. D. A. Davies reports, in the *British Medical Journal*, October 17, 1885, the case of a woman, aged thirty-eight, 4-para, who, three days after delivery, when sitting on the night commode, felt a severe shock with the sensation of something coming away from her, and was helped back to bed, sick and faint.

She was attended by a midwife, and was not seen by a medical man for some months afterwards. Repeated but unsuccessful attempts had been made to reduce the completely inverted uterus. The patient suffered from frequent vomiting, hemorrhage, and leucorrhœa. Ultimately (the length of time which elapsed since delivery is not stated) the uterus was replaced by means of Aveling's repositor. It is said to have "corrected itself during the night" following the application of the instrument. On the following morning the cup was found to be in the uterus, and was removed. Two days after, the posterior wall (not the fundus) was found to be bulging inwards and downwards, a condition which was readily corrected by pressure with the fingers. A distinct slip accompanied the process. The patient kept her bed for a month, and in three or four months had regained her strength. Subsequently she menstruated normally and became pregnant. No incident worthy of note occurred after delivery.

The interesting point is the spontaneous return of inversion, and its site.

On Premature Detachment of the Placenta due to Nephritis.

But little is known of the conditions under which the normally situated placenta becomes detached during pregnancy, though this occurrence is accompanied by so great a risk both to mother and child that it cannot but be looked upon as of great importance. Three cases have lately come under the care of Winter (*Zeitsch. f. Geb. u. Gyn.*, xi. p. 398), and are of interest as tending to throw light on the etiology of this rare accident. As regards symptoms and treatment, these cases resemble those published by Goodell and by Brunton.

One case may be briefly given as an illustration:

"A. B., aged forty, admitted July 30, 1884, in the eighth month of her first pregnancy; has suffered for six weeks from œdema of legs, nephritic vomiting, and headache. Twelve hours ago sudden severe pains came on in the abdominal and sacral regions, accompanied by slight external hemorrhage; since then fœtal movements have ceased.

"On examination the uterus was found to reach a hand breath higher than it usually does at her period of pregnancy, and to be extremely tense and overdistended; fœtal parts difficult to make out; fœtal movements and heart-sounds not perceptible. Contractions of the uterus could not be perceived by the observer, though periodical exacerbations of the constant bearing-down pains were felt by the patient. None of the changes characteristic of labor were present; external os patulous, cervical canal and internal os closed. Moderate degree of œdema of legs, face, abdominal walls, and hands. Urine clear, scanty, and contains much albumen; morphological elements too few for microscopical examination; numerous petechiæ on the body. Heart and lungs healthy; skin of a pale yellowish tint."

External hemorrhage increased during the course of labor, so that the vagina was plugged several times; the size and tension of the uterus were both observed to increase. When the labor had lasted ten hours, the internal os opened and the membranes were felt to be extremely tense.

The diagnosis at this stage did not seem quite clear, and, as owing to the hemorrhage an early delivery appeared desirable, turning was resorted to. On rupture of the membranes, the examining finger seemed to come in con-

tact with soft masses, very like blood-clots, which probably lay just behind the membrane.

A small fœtus already showing signs of maceration was extracted, and the delivery of the head was followed by a mass of fluid and clotted blood in a state of decomposition. The placenta was expressed half an hour later, and presented a very characteristic appearance; it was everywhere greatly flattened and thinned, with the exception of an edge (half an inch thick and running along half the circumference) which looked healthy. The flattened portion was covered with coagulated blood-clots.

This observation settled the diagnosis that the placenta had been everywhere detached with the exception of the healthy looking margin; blood had collected behind it and the membranes, had caused the increase in size and tension of the uterus, and had led to external hemorrhage. The death of the fœtus was, of course, unavoidable. The uterus contracted well after delivery. The nephritis soon disappeared like an ordinary case of nephritis due to pregnancy, the albuminaria rapidly diminished, and eleven days after delivery was gone. The œdema also began to decrease soon after the labor.

The other two cases in the main resembled the above, and indeed the symptoms of all three closely followed those recorded by Goodell and Brunton.

In the author's cases, however, anæmia and collapse were less marked. The uterus was enlarged to the size of one and a half months further advanced in pregnancy. The distention of the bag of membranes varied, owing to the different amount of blood effused. In all three the weakness of uterine contractions was very striking.

The prognosis for the fœtus was determined by the almost complete detachment, death being then inevitable. The result as regards the mother was recovery in 100 per cent. in the author's cases as compared to the average 50 per cent.; this point is worthy of notice, and opens up the question how far the treatment was the cause of the recoveries.

All accoucheurs are agreed that a rapid delivery followed by strong uterine contractions forms the best means for arresting the hemorrhage; whenever the soft parts allow of delivery, even of accouchement forcé (within moderate limits), it should be brought on even at some risk to the mother.

But the majority of cases apply for treatment when hemorrhage has set in during pregnancy or when pains caused by the hemorrhage have just begun to affect the cervix; in such cases forced delivery is out of the question; two methods of procedure are recommended:

Goodell advises early rupture of the membranes, inasmuch as the uterus thus diminished in size contracts better and closes the bleeding spot; pains, also, are more likely to set in.

Brunton and others consider that the pressure on the internal uterine surface by the liquor amnii and the limited extensibility of the uterus are most likely to arrest hemorrhage, especially when a tampon also is used, and the membranes are not to be ruptured until everything is ready for an early termination of the labor, either by interference or not. The correctness of this view is supported by the result of the author's experience.

But the chief interest of the author's three cases centre in the etiology. None of the usual causes for premature detachment—cough, vomiting, straining at stool, etc.—were present; no history of injury or congestion of the uterus was obtainable. On the other hand, in each of my cases nephritis was present.

In the first case, it was probably due to pregnancy, and associated with a hemorrhagic diathesis; in the second, the nephritis was chronic; the third was a case of typical nephritis of pregnancy, and left no doubt of the connection between nephritis and the premature detachment of the placenta. This view of etiology is, as far as is known to the author, new, though Goodell speaks of nephritis as a complication, and other authors mention symptoms which point in the same direction, such as œdema or diminished urinary secretion.

As yet, the author is not prepared to give any pathological explanation of the connection between early detachment of the placenta and nephritis which he has shown to exist.

On the Physiology of the Expulsion and Post-partum Stages of Labor.

Schröder contributes to the *Zeitsch. f. Geb. u. Gyn.* (xi. p. 421) an instructive paper on this subject, of which the following are the main points:

At the commencement of the expulsive stage the uterus lies somewhat to the right of the middle line, and rotated on its longitudinal axis in such a way that the left round ligament is on an anterior plane to the right. The dorsum of the fœtus corresponds to the left edge of the uterus, being directed to the left and forwards. The fundus reaches to the costal arch, the uterus being longer and narrower than at an earlier period of pregnancy. Even at this stage of labor, in cases where the head lies lowest in the pelvis, the breech is no longer in contact with the fundus, and the more the expulsive stage has advanced, the further they are apart. This can be proved by measuring the distance from the advancing head to the fundus, and comparing the results with the length of the fœtal body (when in utero) which we know. As soon as, during the expulsive stage, the breech has left the fundus uteri, the latter can no longer exert any special pressure on the longitudinal axis of the fœtus, which henceforth is forced onwards merely by the "general pressure of the uterine contents." This pressure probably diminishes gradually toward the end of labor as the contracting part of the uterus (*i. e.*, that above Bandl's ring) moves upwards, and the muscular bundles shorten (as the uterine wall gets thicker) and become less effective. The rising up of Bandl's ring is a physiological event, and the parts below it bear being stretched very well; the danger of their giving way arising in cases of unequal stretching, as when one side is stretched while the fundus is displaced toward the other.

During labor the uterus ascends to such an extent that scarcely half the child (perhaps only a third) lies in the contracting portion, and the organ would doubtless be even smaller if that part in which the placenta lies took an equal share in contracting. Under these circumstances, by the time that in a primipara the head has reached the pelvic floor, the uterus can no longer exert any material force on the child, henceforth abdominal pressure must help. That it can do so is proved in several ways; *e. g.*, by the expulsion of the child by a post-mortem development of gases in the abdomen of pregnant women who have died without being delivered.

The true view of insufficiency of expulsive force was taken by Hofmeier when he showed that in primipara the head often remained for a long time

on the pelvic floor, owing to the uterus having risen up so high that its contractions had lost all effect on the fœtus.

It is characteristic of old multiparas with flattened pelvis, that, even while the cervix is opening up, the uterus draws itself up above the child so that the latter lies almost entirely in a loose sack formed by the lower segment of the uterus and the cervix. Such a case must not be looked upon as caused by weak pains, inasmuch as the uterus has done its usual amount of work, and would have expelled the child but for the pelvic contraction.

The energetic action of the abdominal muscles is, therefore, of the highest importance for expelling the child; for it has to overcome the resistance of the floor, and almost unaided it forces the head through the vulva, and finally expels the trunk, though the vagina may in some measure come to its assistance.

The changes during the post-partum period have been described by Schultze, and lately by Ahlfeld. A diminution of intrauterine pressure is of importance, as facilitating the detachment of the placenta. The period when the latter begins is difficult to fix; the central part is first detached, blood is effused between the uterine wall and placenta, and the detachment of placenta and membranes proceeds in such a manner that in cases where the placenta was inserted at the fundus, it appears at the vulva completely inverted; the whole of the blood being contained within the inverted membranes. If one edge of the placenta is lower than the remainder, the membrane may give way first at that side, and blood appear externally; the upper edge of the placenta still adhering, and being expelled as Duncan has described.

During the post-partum period the fundus uteri remains above the navel, unless pushed down by pressure of the hand or abdomen, and it rises even somewhat higher when the placenta, after being expelled from the fundus, fills the lower segment of the uterus.

The placenta often remains below the contraction-ring for a long time, as the mechanism destined to expel it from the vagina (its own weight and the abdominal pressure) does not always accomplish its purpose.

The practical points which result are as follows:

During the expulsion period a powerful abdominal pressure is of the greatest importance, and sedatives are of use in diminishing suffering, and allowing the abdominal muscles to act. Ergot at this period is, as a rule, not called for, inasmuch as the uterus has performed its proper share of work.

The mechanism which expels the placenta from the fundus works well; while that expelling it from the lower genital canal is untrustworthy. The precaution of keeping the hand above the uterus after the birth of the child is unnecessary. When the placenta has reached the lower uterine segment it is recognized by a diminution in the size of the whole organ, and a fulness above the symphysis corresponding to the lower uterine segment. By manual pressure just above this fulness, but below the fundus, the placenta may be easily and completely expelled. If, however, it emerges in the way described by Duncan, the loss of blood is often considerable, and the pressure not so easily applied, since the upper edge may remain in the fundus.

GYNECOLOGY.

Removal of the Ovaries in the Treatment of Uterine Fibromyomata and of Unrestrainable Menorrhagia.

In 1823 James Blundell proposed, in a paper read before the Medico-Chirurgical Society of London, to remove the ovaries in cases of severe dysmenorrhœa, or of menstrual hemorrhages proceeding from an inverted uterus, when extirpation of the latter organ was contraindicated. The proposal, however, passed unnoticed and even seemed forgotten, until the year 1872, when Battey and Hégar performed removal of the ovaries for severe dysmenorrhœa. To which of these operators the credit of priority is to be conceded remains doubtful. One point is certain: numerous imitators arose in various countries, and by their excess of zeal did much to bring the operation into disrepute. Dr. Simon Duplay, in an able article in the *Archives Générales de Médecine*, July, 1885, draws attention to the value of the operation in cases of unrestrainable menorrhagia, and, above all, in those in which menorrhagia is symptomatic of fibromyomata of the uterus. The frequent failure of drugs in controlling these hemorrhages is well known; equally well, the want of success in any attempt to treat or hinder the growth of these uterine fibroids. In removal of the ovaries, however, both these indications are met; physiology has inseparably connected menstruation with ovulation; without ovaries menstruation cannot exist; and clinical observation teaches that, with the onset of the normal menopause, menorrhagia almost always stops, and uterine fibroids cease to enlarge or even tend to disappear. Recognizing these truths, as well as the success of oöphorectomies done under these circumstances, Duplay decided to perform Battey's operation, and below are reported two cases, the results of which were most satisfactory.

Case I.—Uncontrollable metrorrhagia; uterine fibromyoma; castration. Elise P., aged twenty-six, single, housemaid, admitted August 12, 1879, into Hôpital Lariboisiere, under M. Siredey. Hemorrhagic tendency; history of severe attacks of epistaxis, followed by fainting; slight wounds bleed severely. Menstruation at thirteen, regular, monthly, free; lasts about fourteen days; no pain. Present illness dates from May 20, 1877. On that day, the fifth day of her monthly period, severe hemorrhage set in and continued for fifteen days, then ceased completely until the return of the next monthly period, when the same process was repeated. This state of things continued up to December of the same year. Medical treatment during this period was of no avail, and on her admission in August the loss was nearly constant. Vaginal examination by M. Siredey revealed the presence of a small fibroma (the size of a mandarin orange) situated in the right side of the uterus; anæmia and cachexia were well marked. In November, 1880, all treatment having failed, while the tumor was increasing and the anæmia and cachexia had become developed to a severe degree, the ovaries were removed; the patient made a good recovery, and rapidly regained flesh and color. Between January, 1881, and August of the same year, discharges of a reddish color, accompanied by clots, appeared. These losses at first corresponded with the menstrual epoch,

but later came at irregular intervals; at no time abundant, they disappeared totally after August, 1881. About this time symptoms indicative of Bright's disease made their appearance, and, gradually increasing in severity, led to the patient's death on the 13th of October. At the autopsy the liver, spleen, and kidneys were found to have undergone amyloid degeneration; in the fundus of the uterus was a fibroma as large as a mandarin orange.

CASE II.—Menorrhagia caused by a uterine fibromyoma; castration; recovery. Marie S., aged thirty, seamstress, admitted March 7, 1883, under M. Siredey. Menstruation at fourteen, regular, monthly loss moderate, duration three days. One child born nine years ago. The patient usually enjoyed good health, but in 1880 she began to flag and lose flesh and strength, and in February, 1881, at the close of the monthly period, a severe metrorrhagia set in. This latter was checked by ergot and acids, but returned after fifteen days, and was with difficulty controlled by ergot. After this, severe hemorrhage recurred every three weeks. For some months before admission the metrorrhagia, in a varying degree, had become almost constant. While in hospital, M. Siredey recognized in the left wall of the uterus, toward the upper part, a small fibroma about the size of a nut. In May, 1884, the fibroid had undergone a considerable increase in size, and, as the anæmia and loss of blood were endangering the patient's life, operation was decided upon. Oöphorectomy was performed on June 27. The left ovary was found without difficulty, and removed; the right was seized with some trouble, tied, cut away, and its stump touched with carbolic acid. The patient made a good recovery, and rapidly gained flesh and strength; the fibroid gradually decreased in size; slight hemorrhage occurred occasionally for a short period, but was never of any importance; a free leucorrhœal discharge existed for some months, but gradually ceased; an oozing from the nipples was only of short duration, and in six months' time the health was completely restored. Questioned on the subject of sexual appetite, the patient affirmed that, since the operation, these feelings have become very marked, and are at times a source of real difficulty to her. Of the ovaries removed, the left is found to be the larger; microscopical examination shows the presence of hemorrhagic foci; the vessels are dilated, and their walls thickened; numerous cysts, springing from old Graafian follicles, are present; the connective tissue is in excess, and there is a striking atrophy of the Graaffian follicles; no corpora lutea are to be seen.

M. Tissier has collected 171 cases of oöphorectomy performed for uterine fibromyoma, accompanied by severe hemorrhage. Of these, 25 died, giving a mortality of 14.6 per cent. only, a death-rate lower than that of most major surgical operations. Of the 145 cases which recovered, in 7 only did the hemorrhage return after a short interval; in 3 cases the bleeding returned, but notably less; in 21 cases slight losses of blood returned, and persisted for some weeks or months, but then finally disappeared; in 114 cases the hemorrhage ceased after the operation, once and forever. These statistics might be found even more satisfactory if we note that in two cases only one ovary was removed, and in another a considerable amount of ovarian tissue was left in the pedicle. Certainly the conclusion is justifiable that oöphorectomy causes, either immediately or in a short time, the complete cessation of all hemorrhage.

Once more reviewing these 145 cases of recovery, we find that in 9 cases only was evidence found of undiminished or increased growth of the tumor after operation, while in 66 cases the growth rapidly atrophied, and in the other 70 a complete cure was noted without giving special information regarding the condition of the fibroid. In weighing the indications and contra-indications of the operation, the death-rate has to be considered, and with a percentage of 14.6, every resource of therapeutics should be first thoroughly tried. Of course, on the other hand, the dangers of exhaustion resulting from undue delay must be borne in mind. The operation is clearly not applicable to fibroid polypi or submucous fibroids, which can be attacked *per vaginam*. Castration can be thought of only in cases in which a fibroid tumor is interstitial or subperitoneal, inaccessible and incapable of being operated upon by the usual methods, either because of its volume or its situation. As regards the gravity of the operation, there is no comparison between oöphorectomy, with its percentage of 14.6, and hysterectomy, with a death-rate of about 41 per cent.; yet these two have been compared as alternatives, though, in truth, each of them has its own special indications. According to size, fibroids may be classified as (1) small—*i. e.*, not exceeding the size of an egg; (2) medium, or those rising above the pelvic brim to a level midway between the pubis and umbilicus; and (3) voluminous—*i. e.*, reaching or extending above the navel. For these last, which are sometimes cystic, hysterectomy alone is suitable. To the first two classes, oöphorectomy is applicable, at all events in the great majority of cases. It must be borne in mind that, should hemorrhage persist after removal of the ovaries, hysterectomy is still available, and in cases recorded this course has been followed with marked success. In operating for the removal of the ovaries, the abdominal method is far superior to the vaginal, the central median incision to making two lateral ones. The abdominal incision should at first measure from four to four and four-fifths inches, and should be prolonged upward without hesitation if more space is needed. Regarding the advisability of removing the Fallopian tube with the ovary, though the reporter does not by any means entirely agree with Lawson Tait as to the influence of the tubes on menstruation, yet he thinks it well to include the fimbriated extremity in the ligature, as thereby one is more certain of not leaving any ovarian tissue behind. Of course, it is needless to dwell on the absolute necessity of removing both ovaries.

On the Anatomy of Parovarian Cysts.

Dr. Gustav Killian, in the *Archiv f. Gyn.*, xxvi. p. 460, after describing the anatomical and microscopical characters of five parovarian cysts removed by Prof. Hégar, compares his observations with those of other authors who have written on the subject.

The peritoneal covering of the cyst in each of the five cases was smooth in its greatest extent, though three showed remnants of adhesions. The latter are decidedly uncommon in parovarian cysts, so much so that Duplay says, "Peritoneal adhesions, though so frequent in ovarian cysts, do not occur in parovarian."

The abundant folds on the inner surface which have been noticed by others were present in all five cases, and Killian, without denying that the involuntary muscular fibres have a share in producing them, as has been

previously held, believes that they are in part due to local thickenings of the inner connective tissue layer.

As regards the relation of the Fallopian tube to the cyst, he found that in three typical cases it adhered for a distance nearly equal to its whole length, from which he infers that the tube as a whole had been stretched. In two of the three, moreover, distinct enlargement was present, indicating that the ampullary region was involved. In all three the "fimbria ovarica" was stretched, and in one the ovary itself. The uterine end of the ovary was at some distance from the wall of the cysts, a relation doubtless due to the fact that the parovarium is in connection with the end of the ovary away from the uterus. The ovaries were usually hypertrophied, probably owing to the prolonged venous hyperæmia caused by pressure of the cyst. The form of pedicle varies greatly. It may be absent, as in cases in which the cyst grows toward one or other pelvic organ (vagina, rectum, or bladder), or it may, as in the first of Killian's cases, involve the Fallopian tube and the whole of the broad ligament as far as the uterine end of the ovary.

The epithelium, which (according to its origin) should be ciliated, was by no means invariably so; some observers have convinced themselves of the presence of ciliated epithelium in their cases, others speak doubtfully of the existence of cilia. Killian himself observed several cells with a notched free border, but leaves it an open question whether it was due to cilia or not. Well-marked cylindrical epithelium was present in three out of his five cases, and he found it always associated with cubical cells. In two cases he met with a cyst lined by a single layer of tessellated epithelium, and he was able to observe its gradual passage into cubical and cylindrical cells; he concludes, from this observation, that in an encysted cavity even tessellated cells may be derived from narrow cylindrical cells. This change in shape he believes to be due to pressure exerted on the cells by the encysted fluid. In those parts of a cyst which expand most rapidly (and in most cysts this expansion is more rapid in some parts than in others) the walls usually become thinnest, and a tension is exerted on the epithelial cells lining the cavity, which become flattened owing to the tension. According to this view, the thinnest part of the cyst-wall should have the most flattened epithelium, and Killian actually made the observation that one of his cysts had a flattened epithelium over a bulging and thin portion, and a cylindrical epithelium everywhere else. Amongst the cylindrical cells he found some that had undergone mucous degeneration, and he looks upon them as analogous to the goblet cells of the intestine. Parovarian cysts may (like ovarian) be divided into papillary and glandular, but cysts are occasionally found which belong to neither category.

Of the papillary, Killian met with two examples differing in the degree of development which the papillæ had attained. The glandular form has, he believes, not been hitherto described, though Spiegelberg noticed tubular depressions of the epithelium which other observers have looked upon as folds of the inner lining of the cyst. Secondary cysts, Killian believes, may be formed by the retention of secretion in these glands, and need not always, therefore, be due to dilatation of other tubes of the parovarium. As regards the connective tissue walls of the cysts, nothing unusual was noted, except that no trace of the delicate multinucleated network described by Spiegel-

berg could be found. In two cases out of the five, smooth muscular fibres were seen on the walls. For the diagnosis of parovarian cysts, Killian relies on the following points: The Fallopian tube and ovary are in contact with the cyst, the ampullary region is stretched, and so also are the "fimbria ovarica" and the ovary; of especial importance is the fact that the uterine end of the ovary is at some distance from the cyst-wall. Perhaps the facility with which the cyst-wall can be divided into two layers may also be of value.

The Modern Treatment of Uterine Myoma.

Mr. Lawson Tait, in the *British Medical Journal*, Aug. 1885, maintains (1) that removal of the uterine appendages for myoma "when properly performed" is not a fatal operation, and (2) that its results are satisfactory and permanent.

In proof of (1) he brings forward 58 cases, operated on since January, 1884, without a death, and refers to a published series of 50 up to the end of 1883, in which there were 2 deaths.

In proof of (2), that the results of the operation are satisfactory and permanent, he gives brief notes of the results in the first 50 cases operated upon by him in which recovery took place. These operations extended over a period of some years, from August, 1872, to March, 1883. The ages of the patients varied from twenty-eight to fifty-two years. The tumors for which these operations were performed varied in size from the bulk of an orange to a size extending far above the umbilicus. The results of these 50 cases may be briefly stated as follows:

(1) *Alteration in Menstruation.* In 12 cases no note is made; in 25 cases menstruation ceased completely and immediately after removal of the appendages, but 1 of these died about six months after the operation from cancer of the uterus, while in 11 menstruation ceased after a shorter or longer period. In 1 case, however, in which menstruation ceased completely and immediately after the operation, the tumor is reported as unaltered in any way, but the patient was in the enjoyment of perfectly good health. In 2 cases menstruation was not arrested; in one of these the loss was diminished, but the tumor continued to grow; and, in the other, the patient menstruated regularly, the flow being occasionally profuse, but the tumor disappeared almost entirely.

(2) *Alteration in the Tumor.* In 13 cases the tumor "entirely disappeared;" in 18 cases it is reported as having diminished in size, often very considerably; in 1 case mentioned above, in which complete cessation of menstruation followed the operation, the tumor remained unaltered; in 1, also mentioned above, the tumor continued to grow, and the patient was slowly dying from its effects; and in 1 the patient died about six months after the operation from cancer of the uterus. In the remaining cases the result as regards the tumor is not given.

Thus, in the 50 cases, the latest two and a half years ago, failure has occurred in only two instances. In one menstruation was not arrested, and the tumor has continued to grow; in the other, the patient died from cancer of the uterus, the tumor having been either cancerous from the outset and mistaken for myoma, or originally a myoma which became cancerous after the operation.

Two of the patients have been admitted to asylums since the operation; but in one the insanity was pretty evident before the removal of the uterine appendages; and in the other it showed itself almost as soon as she was out of the anæsthetic, so that the indirect effects of the operation can hardly be credited with this unsatisfactory result; it is merely the insanity which is known to occur after almost every surgical operation which is undertaken.

Of the 50 cases, 2 were attended by failure; 2 of the patients have died from other causes since the operation, 1 it has been impossible to trace recently, and there remain 45 cases of which notes have been observed up to the date of writing. These results fully justify the following conclusions published in the AMERICAN JOURNAL OF THE MEDICAL SCIENCES for Jan. 1882: "That, as far as its primary results are concerned, removal of the uterine appendages for the arrest of intractable uterine hemorrhage, is an operation which is as easily justified as any of the major operations of surgery;" and, "That, so far as its secondary results are yet seen, it is an operation which yields abundant encouragement for its further trial."

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

UNDER THE CHARGE OF

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CRIMINAL LAW AMENDMENT ACT IN GREAT BRITAIN.

Toward the close of the last session of the British Parliament, a Criminal Law Amendment Act was passed which considerably modifies the existing law in Great Britain as to the crime of rape and indecent assaults on females. Prior to 1875, carnal knowledge of a female under 10 years of age was held to be rape and felony, even although the girl had given her consent; if the female were between 10 and 12 years, and consent was given, the lesser charge of misdemeanor was preferred. In 1875 an Act was passed raising those ages to 12 and 13. By the Act of this year it is now a felony punishable with penal servitude for life, or a shorter term, to have carnal knowledge of a female under 13; while it is a misdemeanor, punishable with imprisonment not exceeding two years, to commit the offence on a female between 13 and 16, even though consent be given.

SUDDEN DEATH SIMULATING DEATH BY POISON.

PROF. VON MOSCHKA (*Vierteljahrsschrift für gerichtliche Medicin*, N. F. Bd. xliii. S. 1–6) relates several cases of this nature. The first is that of a woman, twenty-eight years old, who, five months previously, had borne a child, and was acting as wetnurse in a house. On December 20, 1884, she commenced to complain of pain in the neighborhood of the stomach and liver. On January 1st the pain became very severe, and was accompanied by violent vomiting. This continued for fourteen hours, when death occurred.

These symptoms were such as to excite considerable suspicion of death by poison. Accordingly, a careful post-mortem examination was made. Although slight erosions with blackened edges were found in the stomach and duodenum along the crests of the folds of the mucous membrane, yet no poison was discoverable in the alimentary fluids. The hepatic vein was filled with a large clot extending to its minutest branches in the liver. The lungs were highly œdematous. The immediate cause of death was acute pulmonary œdema, which, in its turn, was due to the disturbance of the circulation consequent on the extensive thrombosis in the hepatic vein. The alterations of the alimentary mucous membrane were similarly produced. The thrombosis was perhaps of a syphilitic origin.

This case illustrates the importance of a careful examination of every part of the body in medico-legal autopsies.

The next case is likewise that of a young woman who, after complaining for a week of slight occasional pains in the abdomen, was suddenly seized in the evening with vomiting and with severe pain in the right iliac region, and died next morning in a state of collapse. The circumstances of her death pointed to the possibility of its having been due to poison. The autopsy, however, showed that it was really due to ulcerative perforation of the vermiform appendix near its origin from the colon. The alimentary canal was otherwise normal.

In the third case, which is similar to the foregoing, a man, aged thirty-four, died after a sudden illness of six hours' duration, accompanied by vomiting and abdominal pain. Here, also, there was a suspicion of poisoning; but, on examination, death was found to be caused by perforation of the appendix vermiformis.

In both cases there was a considerable degree of peritonitis.

Albumen in Urine of Dead.

Vibert and Ogier (*Annal. d. Hyg. publ.*, tom. xiv. pp. 65–72) report the results of the examination of twenty-eight bodies of the Morgue in Paris, in respect of the presence of albumen in the urine of dead bodies. In all, except five, they found more or less albumen, which was not to be distinguished from the albumen met with in albuminuria. From these observations, and from a few experiments, they conclude that the urine of the cadaver nearly always contains albumen, and in greater quantity the more advanced in putrefaction the body is; further, that the albumen is obtained by solution from the walls of the bladder.

Sexual Cases.

Braxton Hicks (*Lancet*, Aug. 1, 1885) relates the particulars of a few sexual cases of medico-legal interest. The first is a case in which the husband sued for nullity of marriage on account of impossibility of intercourse with his wife from her inability to separate her thighs. She could stand upright, and partially bend the thighs on the abdomen. B. H., in answer to the court, stated that the condition was probably remediable—by division of the adductors. However, for another reason—continual absence of the husband since the day of marriage—the suit was not granted. In the second case the suit

for judicial separation was preferred by the wife on account of the unhealthy condition of the organs of generation before and after marriage. The husband was proved to be suffering from a perineal abscess, the sequel of gonorrhœa, contracted some years previous to his marriage, for which abscess he had undergone one or two surgical operations. Marriage took place before the parts were restored. Intercourse occurring at irregular intervals afterward, the woman acquired uterine leucorrhœa and pelvic cellulitis, which she attributed to connection with her husband in his diseased condition, and in this she was supported by the medical witnesses. Her suit was granted.

The third case was one of a suit for nullity of marriage by the husband on account of the frigidity of his wife. Without having any repugnance to her husband, she had never permitted any intercourse. The suit was granted.

The fifth case was one in which the wife became demented after the marriage night. After some weeks the excitement subsided. It appeared that the husband, aged forty, of studious habits, had had some difficulty, from want of knowledge, in attempting coitus on the wedding night. His wife had become excited and then maniacal, and he himself was considerably frightened. The wife's friends were on the point of craving divorce. After rest and tonic treatment both recovered and resumed cohabitation, and a year later the woman gave birth to a child. The seventh case was that of a doctor who was tried for manslaughter on account of his having deserted a woman in labor, whom he was called in to attend, from the husband employing abusive language toward him. Other medical assistance was obtained after a time, but the labor was a difficult one, involving turning, and the woman died of puerperal fever. The doctor was acquitted, since it could not be proved that the same result might not have followed had he remained with the patient; but it was strongly laid down by the judge that a medical man should on no account leave a woman in labor, except his life was in peril; that he should tell them to get another attendant, and should not leave till the other arrives; otherwise, should the woman suffer from want of help, he would be held responsible for it.

Ptomaines.

An important addition to our knowledge of ptomaines has been made by Gram, working in the laboratory of Schmiedeberg (*Arch. für Exper. Pathолog. u. Pharm.*, Bd. xx. S. 116–125). He calls attention to the facility with which choline, a widely spread constituent of animal and vegetable tissues, undergoes conversion into neurine (vinylbase) by the operation of simple chemical processes, without any fermentation whatever. The importance of this is apparent when it is remembered that vinylbases are among the most important of the poisonous alkaloids, described by Brieger and others as resulting from the putrefaction of animal substances. Pure choline, which is an ox-ethyl compound and easily derivable from the lecithin present in the flesh, has no, or very little, toxic effect, whereas the vinylbase, which Gram proposes should be named vinyl-choline instead of neurine, giving the name ox-ethyl-choline to choline, has a powerful poisonous and muscarine-like action. Gram has found that by simple heating of choline with lactic acid, or of the compound of choline with tartaric acid, but especially of the acidulated platinum compound, the choline is readily converted into vinyl-choline. It is, therefore,

readily intelligible how that much of the so-called ptomaines which have been discovered in putrefying animal substances may be created by the chemical processes used for their separation, instead of by the previous fermentation. It is, therefore, essential in all investigations on ptomaines to be very careful as to the chemical methods of separation employed, and to be chary of attaching importance to the presence of alkaloids with a muscarine-like action.

Alkaloids in Old Flour.

Balland, a pharmacist (*Journal de Pharmacie et de Chimie*, t. xii. p. 341, Oct. 1885), states that he has discovered the presence of alkaloids in flour which has been kept in sacks for two or three years, and that he failed to find them in new flour. The alkaloids proved, he says, poisonous to sparrows. His method of ascertaining the presence of the alkaloids was too crude to be very reliable in its results. It is, however, quite possible, if not probable, that alkaloids in old, damp, fermenting flour are found just as they are in putrefying flesh; and it is likewise probable that such alkaloids are sometimes of a poisonous character.

Digitalin.

P. Lafon (*Progrès Médical*, June 20, 1885) gives the following as a reliable and characteristic test for digitalin: Mix the digitalin with an alcoholic solution of sulphuric acid, and add a drop of a strong solution of perchloride of iron: a blue color results.

Ergot as an Abortifacient.

A series of letters have lately appeared in the London *Times* (*Lancet*, Sept. 5, 1885), which show that it is no uncommon experience to find that the eating of fodder containing ergot produces abortion in cattle. This, if true, is important in relation to the often disputed abortifacient action of ergot in women. No one denies the action of ergot on the uterus after uterine contractions have once begun, but few believe that it is capable of initiating such contractions in a previously quiescent and pregnant uterus. Its action in domestic animals, however, renders it highly probable that in the cases of certain women, at least, it may act as an abortifacient. It may be added that action on domestic animals, as observed by the laity, is in accordance with the results obtained from laboratory experiments.

Chloroform Poisoning.

Llewellyn Eliot (*New York Medical Record*, July 11, 1885, p. 29) gives a valuable summary of all the published cases (56) of poisoning by the swallowing of chloroform, along with a report of a case of his own, in which, however, he was enabled to effect the recovery of the patient. The poisonous dose in his case was about two ounces; in the other cases the dose varied from half a drachm to six ounces. In his case the patient had dilated pupils, cold extremities, weak pulse (70), sighing respiration, great drowsiness, intense burning in the throat and stomach, and abdomen generally. As he was called to the patient within ten minutes after the chloroform was taken, the

patient was not yet unconscious. Emetics, and afterward coffee, were given, as also sweet oil to allay the burning sensation. The patient had practically recovered within a few hours. It appears from the summary of the other cases, that the pupil is often contracted instead of being dilated, although dilatation is the more common condition. And, although many of these were unconscious and breathing stertorously, only 16 out of 56 died. The average time in which death occurred varied from 12 to 48 hours; in 1 case it was 1 hour, while in 2 cases it was 8 days. In the latter cases death was due to gastritis.

Rhamnus Frangula.

O. Petersen publishes, in the *St. Petersburg. Med. Woch.* (*Lancet*, Oct. 10, 1885), an account of a case of poisoning from taking the berries of the black alder (Rhamnus frangula), the bark of which is now so largely used as an aperient. It appears that the person—a boy—had eaten and chewed the stones as well as the pulp; and Petersen believes the symptoms were those of poisoning by prussic acid, which is present in the stone of this fruit, as it is in that of many others The symptoms were headache and vertigo, succeeded by unconsciousness, with severe clonic spasms, rapid small pulse, dilated pupils, and feeble respiration. The patient was restored to consciousness by cold affusions to the head, and ether, purgative enemata, and emetics completed the recovery.

Hymenoptera.

Carlet, of Grenoble (*Lancet*, Sept. 19, 1885), states that the sting of bees, wasps, and hornets, which is supplied with poison from two glands, has in one gland an acid, and in the other an alkaline secretion. The mixture alone is poisonous, and has a slightly acid reaction. In wasps and hornets the venom is injected by means of a contractile vesicle. In bees the poison-bag is not contractile, but there exists a kind of piston for the discharge of the poison.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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Influence of Smallpox Hospitals on the Surrounding Neighborhood.

Foremost amongst the defences of the public health is the means of isolation of infectious disease. American and European countries have for years regarded the isolation of the infectious sick as the chief method by which the extension of infectious maladies from one person to another can be prevented.

The notification to the local authority of cases of infectious disease has been valued as a means toward this end, rather than as affording information of the operation of a cause of disease which might be checked at its onset.

For the isolation of infectious persons occurring in populous districts, the provision of special hospitals has been largely encouraged, and, until recent years, no serious doubt has been raised that this method of affording security to the many was attended by a material disadvantage. Perhaps the earliest instance of organized opposition to the existence of such institutions occurred in the year 1802, when the London Fever Hospital made its beginning in a house situated in a street. But the opposition did not result in litigation, and the institution continued in this situation for a number of years; it was not, indeed, until a smallpox hospital was opened at Hampstead, in the northern part of London, that the cry was definitely raised that injury to life and health was inflicted upon the inhabitants of this neighborhood. Later, litigation ensued, and it was proved to the satisfaction of the court that an exceptional incidence of smallpox had occurred round the hospital. Finally, the need for more thorough and scientific inquiry into the influence of smallpox hospitals led the Local Government Board to entrust one of their medical inspectors, Mr. W. H. Power, with this duty, and the hospital chosen as the subject of investigation was an institution situated at Fulham, a district in the southwest of London, and concerning which there had been grave apprehensions that it had been in past times a cause of disease to the population surrounding it. Mr. Power's investigations began at the commencement of an epidemic in 1881, which afforded him all the material necessary for his purpose. As to the result of his labors he found:

(1) There had been in each epidemic period since the hospital had been opened, in 1877, an excessive incidence of smallpox in houses in the neighborhood of the hospital, as compared with more distant houses.

(2) The percentage of houses invaded in the neighborhood of the hospital had become gradually smaller, as the distance of the houses from the hospital had increased; this gradation had been very exact and very constant.

(3) Houses upon the chief lines of human intercourse with the hospital had not suffered more than houses lying in other directions from the hospital.

(4) In point of time there has been a very marked relation between the varying use of the hospital and the manifestations of excessive smallpox in the neighborhood; this relation had not shown itself while the use of the hospital had been for convalescents only.

(5) The appearance of excessive smallpox in houses around the hospital had never been delayed until the hospital had become full or nearly full; it had been always most remarkable at the time when admissions to the hospital were beginning to increase rapidly. In the succeeding months of active operations, though the use of the hospital may have gone on increasing, the excess of smallpox in the neighborhood had habitually become less marked.

(6) On comparison of different epidemics, an almost constant ratio was observed between the amount of hospital operations and the degree of excess of smallpox in the neighborhood.

Mr. Power's observation having led him thus far, he proceeded to analyze all the circumstances of hospital administration, with a view to learning whether there could be found any relation between these circumstances and

the behavior of smallpox in the neighborhood of the hospital. The most careful analysis of the movements of residents in the hospital, or of other persons, visitors, tradespeople, and workpeople, failed to give any clew to the cause of the occurrences narrated. Finally, by an examination of meteorological conditions, he sought for those which would enable particulate matter to be disseminated; in this connection he wrote, "Familiar illustration of that conveyance of that particulate matter which I am here including in the term dissemination, is seen summer and winter in the movement of particles forming mist and fog. The chief of these are, of course, water particles, but these carry generally about with them, in an unaltered form, other matters that have been suspended in the atmosphere, and these other suspended matters, during the almost absolute stillness attending the formation of dew and hoar frost, sink earthward, and may often be recognized after their deposit."

He found that "in the days of chief distribution of smallpox around Fulham Hospital, opportunities of a remarkable kind, not for the removal, but for the quiet dissemination of matters contained in the air, and for the deposit, perhaps, of any which were particulate. While the incidence of smallpox upon houses coincident with this distribution of aërially contained matters was almost the same in all directions from the hospital as a centre, the intensity of the incidence (measured by the percentage of the houses invaded) was proportioned to the nearness of the house to the hospital. In these particular days, too, the increasing number of acute cases of smallpox being received at the hospital was charging the air of the hospital with an abundance of infection in an active state."

Another point deserving of notice was that ozone was present in the atmosphere just before, was absent during, and reappeared at the end of the period in which sufferers by the outburst of smallpox became infected. This, then, was the extent of knowledge on the subject up to the year 1882, when a royal commission made inquiry into the whole question of hospital provision for infectious disease. This commision, while accepting as not absolutely proved that smallpox was definitely distributed from the hospitals by means of the air, nevertheless based their recommendations upon the assumption that the disease was communicated in this manner, and they advised that no hospital should contain more than thirty or forty patients, and that in the construction and management of smallpox hospitals opportunities for spread of disease by personal communication and atmospheric dissemination, should be, with the utmost care, guarded against.

The facts as to distribution of disease were in 1884 examined by Drs. Tripe and Gwynn, medical officers of health of other districts in London in which smallpox hospitals were situated, with the result that the same special incidence of smallpox was found to have taken place on houses situated in proximity to the hospitals.[1]

A further report by Mr. Power has just been published in the report of the medical officer of the Local Government Board for the year 1884, dealing with the behavior of smallpox during that year in the district of London in which the Fulham Hospital is situated, and also considering the distribution

[1] Transactions of the Society of Medical Officers of Health. Session 1884–85, London, Shaw & Sons, Fetter Lane.

of smallpox in that district during the two preceding years, a period when the hospital was not in use.

It is important to note, that during the year 1884 an amount of care had been exercised by the hospital authorities to prevent the diffusion of disease by personal communication, which calls for the highest commendation. The removal of patients from their homes to the hospital had been effected in well-constructed ambulances, and no precautions were wanting to insure that there should be no omission of duty on the part of the officers attached thereto. The ambulances were disinfected with chlorine gas before they were permitted again to leave the hospital. The attendants upon the sick were not allowed as frequent leave of absence as before, and they were compelled before doing so, completely to change the whole of their clothing and to bathe in a bathroom provided for the purpose. Visitors to patients were, by a system of telephones, able to obtain information of their friends without coming to the hospital, and were only admitted within the hospital on very exceptional occasions. The number of patients received into the hospital was limited in accordance with the recommendations of the Royal Commission, and at no time were there more than thirty-five cases within its walls, and this number was only attained on three occasions. Cases of all sorts were included in this figure, for patients were retained until convalescence was fully established.

Nevertheless, the outbreak that occurred in 1881 was repeated in 1884, and again distribution of the disease was such that the houses in the neighborhood suffered directly in proportion to their proximity to the hospital, and were distributed in all directions about it, and were not especially grouped along the lines of human traffic.

Mr. Power's conclusions are:

(1) There has occurred during the epidemic prevalence of smallpox in 1884 (in the same way as before recorded for 1881), an excessive incidence of the disease on houses in the neighborhood of Fulham Hospital, as compared with more distant houses in Chelsea, Fulham and Kensington.

(2) The percentage of houses invaded in the neighborhood of the hospital has become gradually smaller as the distance of the houses from the hospital has increased.

(3) Houses upon the chief lines of human intercourse with the hospital have not suffered more than houses lying in other directions from the hospital.

(4) In point of time the excessive incidence on the neighborhood of a hospital has only been observed while the hospital has been in use for the treatment of smallpox.

(5) The appearance of excessive smallpox in the houses around the hospital was not delayed until the cases under treatment there approached the maximum attained during the year. During succeeding fortnights of active operations while use of the hospital increased, the excess of smallpox upon the neighborhood became less marked.

But Mr. Power has observed one new fact which is of vast importance as indicating the dangers which surround the existence of smallpox hospitals, viz.,

(6) The excess of smallpox on the neighborhood of the hospital was quite and specially remarkable at a time when the total admissions to the hospital had not exceeded *nine*.

Further investigation into atmospheric circumstances shows that similar

conditions existed at the time of the outbreak in 1884, that were observed to be present during the outbreak in 1881, but although these circumstances are probably sufficient to account for the dissemination of the disease-particles, Mr. Power points out that some other factor is wanting to produce disease, for the same atmospheric conditions subsequently existed during a time of hospital activity without any resulting outburst.

Vaccination.

The first volume of *Arbeiten aus dem Kaiserlichen Gesundheitsamte*, in Berlin, contains the results of vaccination in the German Empire in 1882. The population of that year comprised 1,459,377 children, or 3.70 per cent. of the total population, of an age to be primarily vaccinated; but of these, 681 had previously had smallpox, and 120,232 had already been successfully vaccinated, leaving 1,338,464 children requiring operation. Of these 1,158,696 were successfully vaccinated, or 95.98 per cent.; 31,441 without result, or 2.35 per cent., and in 5773 the results were unknown. Thus of the total number, 142,507 remained unvaccinated. The reason of the increase of unsuccessful vaccinations was due to the vaccinations in the Grand Duchy of Hesse, where, owing to the introduction of animal lymph, the number of successful vaccinations decreased from 97.31 per cent. in 1881, to 63.44 per cent. in 1882. Thus, if the results in Hesse be omitted, the children in the other States who were successfully vaccinated amount to 97.48 per cent. of the total vaccinations.

It is instructive to find this statement in an official report of the German Empire following in but a few weeks the publication of conclusions of the German Commission on Vaccination, which are as follows:

For vaccination with humanized lymph may be mentioned the certainty of its action, the simplicity of its machinery, the inexpensive manipulation of the lymph.

Against it are urged the known dangers of vaccino-syphilis and erysipelas, the possibility of the conveyance of tuberculosis, and the difficulties which arise in the manipulation of the lymph.

For the use of animal lymph, there are urged the security against vaccino-syphilis, the advantages of a quantity of lymph produced at the same time, the possibility of manipulating lymph antiseptically, and thus a greater safeguard against erysipelas.

Against it, may be taken the less certainty in its results, a more complicated machinery, and the greater cost of production of lymph.

On the whole, however, it must be acknowledged that the advantages of animal lymph outweigh the disadvantages connected with its use, and that it is capable of supplying the place of humanized lymph.

In conclusion, the chief reasons for this decision may be stated as follows:

Compulsory vaccination can only be maintained if injuries to health and life through vaccination, and especially vaccino-syphilis, can be prevented.

This condition cannot be fulfilled by vaccination with humanized lymph.

Vaccination with animal lymph, which in recent times has more nearly approached the use of humanized lymph in its certainty of result, excludes all possibility of syphilis, and offers greater security than humanized lymph against other diseases, such as erysipelas. On these grounds vaccination

with animal lymph should in future take the place of vaccination with humanized lymph.—*Commission zur Erorterung der Impffrage. Denkschrift über die Northwendigkeit der allgemeinen Einführung der Impfung mit Thierlymphe.*

The report just issued of the medical officer of the Local Government Board (*Fourteenth Annual Report of the Local Government Board*, 1884–85. *Supplement containing the Report of the Medical Officer for* 1884) gives important evidence on these points:

1. As to risk from use of humanized lymph, DR. BUCHANAN says, "I wish you again to note the extent of the danger that accompanies vaccination under the circumstances of English vaccination practice. There is little that man, woman, or child has to do, or to have done for them, that does not contain an element of danger; but reasonable people, while endeavoring to remove all preventable risk, do not regard this risk as a reason for not doing what is proper to be done. For example, I find from the last published annual report of the Registrar General that 974 children under one year old were suffocated in a twelvemonth by bedclothes; the fact gives a reason for care in the use of bedclothes, but gives no reason for going without them. So, 55 deaths (51 being of infants under one year) were recorded in that report as from vaccination and the results of vaccination; they doubtless were, for the most part, cases of erysipelas, and their occurrence gives reason for cleanliness of lancets, for avoidance of filthy 'vaccination shields,' and generally for care in vaccination; but it assuredly gives no reason for going without vaccination. When we learn from the same report that 5 infants died in the same year from 'circumcision,' the dimensions of the danger implied in the 55 deaths by 'vaccination' may be understood. As for any remoter injury to the health of the community, attributable to vaccination as practised in England, I can find no evidence of it, statistical or other.

"As a matter of English practice, with all the opportunities for knowledge that come to me, and with an eagerness of search after facts, I cannot learn of communication of syphilis in vaccination being actually effected once in a million of vaccinations.

"I do not think it necessary to speak at length of *tubercular* diseases of children. The small increase of deaths registered as 'tabes mesenterica' has been balanced by a decrease in the deaths of children under five registered as from 'phthisis,' the death-rate from the two together having kept very closely uniform, and the changes in registered mortality of the one and the other being obviously a question of which of certain synonyms is used in medical certificates."

2. As to relative success with animal and humanized lymph.

"In England, these are identical when the operation is done directly from arm to arm, or calf to arm; thus, two operators at the Animal Vaccine Establishment, in London, produced an average of 988 vesicles for every thousand insertions of calf lymph made on infants. Now the employment of stored lymph reduces this average by some 20 or 30 per cent., whether humanized or animal lymph be used. Direct vaccination from calf to arm is only possible in large centres of population; in sparsely inhabited districts the use of stored lymph becomes a practical necessity, unless arm to arm vaccination be resorted to; hence, there is much probability that the decision of the German